THE

FARMER'S MAGAZINE.

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(No. LXXVI.)

BRANCH I.

ORIGINAL COMMUNICATIONS.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Transplantation of Turf.

SIR,

AMIDST the mass of information and intelligence usually to be found in your useful publication, I have been rather surprised to have found no attention, by any of your correspondents, either Scots or English, to a practice which has lately obtained in this county, of laying down land to permanent pasture, by the method commonly called *Inoculation*, but which, I think, you will agree with me, is better designated by the term *Transplantation*. As much misconception has gone abroad respecting this system, I will, with your permission, endeavour to give your readers some account of the process, and the kind of success which has attended those experiments which have come more immediately under my own observation. Mr Blomfield of Warham, near Holkham, an active and intelligent tenant of Mr Coke, was the first discoverer of the transplanting system. He was led to it from observing the effect produced by *beating in* small pieces of turf or sod upon a bank. He saw that these speedily united, and formed a compact, perfect turf; and he immediately conceived the idea of applying a similar process to the formation of pastures. He began his operations in March 1812, upon six acres of land, on which, in the year preceding, he had grown a crop of barley. This succeeded to his utmost wishes; so much so, that, in the next year, he transplanted to the extent of 36 acres, having clean-fallowed the land; making, in all, 42

acres, in two years, of good *old* pasture land, which, by the usual method of *seeding*, he could not have hoped to obtain but after the lapse of many years,—if *by seeds* he could have obtained it at all. These experiments have been inspected by the company attending Mr Coke's annual sheep-shearing for several past years, and have been admired for the facility hereby afforded of producing, in *the shortest possible time, the best possible pastures.* Mr Coke, I believe, was the next transplanter. This eminent agriculturist, ever ready to forward real improvement, and to reward industry and intelligence, wherever and in whomsoever they discovered themselves, immediately saw the benefits to be derived from Mr Blomfield's invention, offered a handsome premium for its extension, having first presented Mr Blomfield with a valuable piece of plate *as the inventor*, bearing a suitable inscription. Mr Henry Blyth of Burnham was the successful claimant at the sheep-shearing of 1817, having, in the preceding winter and spring, converted 11 acres 15 perches from arable to pasture. Mr Heagren junior, of Quarles, is also a transplanter to some extent, though not a competitor for the prize. Mr Harvey of Alburgh, in a distant part of the county, has also transplanted, though comparatively on a small scale, yet enough to satisfy him of the importance and utility of the practice. Mr Margitson of Ditchingham having levelled some pits opposite his house, consulted the writer of this article on the grass seeds necessary to bring it to a turf *as soon as possible.* He was advised to transplant, and, at the same time, to sow white clover on the part transplanted, at the rate of 10 lib. per acre. The work was finished in March. The summer set in dry, and, notwithstanding this circumstance, and a deplorable want of soil, for it was only a stiff, dead clay, *without mould or top-dressing of any kind*, it continued green through the whole summer; while all around it was literally burnt up, and especially a part *immediately adjoining that transplanted*, which had been laid with *flags* (strips of turf) placed close together, as you would lay a grass plot or garden walk. This suffered much from the drought, looking rusty and bare; whilst the transplanted turf, which, from its numerous interstices, one would have thought would have been the most exposed to the effects of the sun, never lost its colour, nor seemed at all stunted in its growth, but pushed up its seed-stems, and now (only six months after planting) covers the ground, and appears a complete bed of grass. There are doubtless many others in the county of Norfolk, who have pursued the system, and whose experience might be adduced in proof of its excellence; but the writer chuses to confine himself to those cases which he can attest from his own personal obser-

vation. In all the above instances, the land was transplanted either in the autumn, winter or spring, (the middle perhaps the best), upon a clean fallow, *and without taking a crop of corn with the transplanted grass.* It remained for Mr Coke to have the honour of improving upon the original invention, by ascertaining the practicability of taking a corn crop with the transplanted turf in the first year; and thereby, without injuring the grasses, to endeavour to raise wherewith to defray the expenses of transplanting. A detail of these experiments is given by Mr Blaikie, the active and enlightened steward to Mr Coke, in a work recently published by him, 'On the Conversion of Arable Land into Pasture.' To this useful little tract, I cannot do better than refer your readers, as containing by far the clearest and best account of the method in question; but, as it may not fall within the reach of many who are anxious to obtain information on the subject, I will proceed to make a few extracts from the work, explanatory of the process pursued by Mr Coke, and necessary to be pursued by others. In this I hope I shall have your permission,—I *know* I shall that of my friend Mr Blaikie,—because I know that nothing ever gives him greater pleasure than to be the means, active or passive, of disseminating information and instruction. Perhaps, too, it may not be less highly valued by you, as coming from a countryman. 'These experiments,' Mr Blaikie tells us, 'were carried on by 'Mr Coke, under his immediate inspection, and upon the farm 'in his own occupation at Holkham.

'*Experiment* 1*st*. A piece of arable land (in extent fourteen 'acres) was clear-out fallowed in the summer 1816; and, in 'the month of November following, was transplanted with turf,' in the manner which I shall hereafter describe. 'In the month 'of April (1817), Heligoland beans were dibbled over the young 'pasture, at the rate of one bushel and a half per acre; and a 'portion of white clover, with permanent red clover seed, was 'sown at the same time, and the whole well rolled down toge-'ther. Owing to the beans being planted late, the grasses 'gained the ascendancy, and injured the crop of beans, which 'are short in the straw, but remarkably well podded. The 'grasses are luxuriant in the extreme, and the ground com-'pletely matted over with turf.' The produce of the beans would not more than cover the expense of seed, harvesting, &c.

'2*d*, A piece of arable land of three acres, had a good crop 'of mangel wurzel upon it last year;—the crop was taken 'up and secured in pits or camps, on the approach of winter. 'The land was ploughed, harrowed, and transplanted with turf

'in the month of March (1817); and in April, some clover 'seeds were sown upon it. Heligoland beans were dibbled, as 'in the former experiment, and the result nearly similar.

'3*d*, A piece of arable land (five acres in extent) adjoining 'to the former, had a fine crop of Swedish turnips upon it, '(grown on the Northumberland, Ridge, or Lothian system), in 'the last year. These turnips were taken up in November, 'and *placed* on the ground;—they were all carried off in course 'of the winter, and consumed in the fold-yards. The ground 'was ploughed, harrowed, and transplanted with turf in the 'month of March. Four bushels per acre of Poland oats were 'sown broadcast at the same time, and the seed scarified in be-'fore the turf was planted; some clover seeds were sown, and 'the whole rolled with a light roller. The oats were a good 'crop, estimated at six quarters per acre; * they were early 'ripe, neatly mown, and harvested without injury to the crop 'or the young pasture, although the bottom was full of grass. 'The young pasture looks beautiful, and is quite covered with 'grass plants; but it follows, that fewer of the planted grasses 'have perfected, and shed their seeds, in this experiment, than 'in the two former. It remains to be proved, which of the 'three pieces of new turf will be the best permanent pasture.'

I saw these specimens in the following year (1818); the sward (the oats as well as the others) had all the appearance of old pasture; or, rather, as the Editor of the Farmer's Journal justly remarks, 'of old pasture which might have been a little 'winter-poached, there being small interstices between the sods 'of turf.' In the park there was also a piece of about 11 acres, which had been transplanted early in the preceding winter, having first been sown with wheat, broadcast. The dry summer was much against the appearance of this experiment; but, notwithstanding the unfavourableness of the season, the wheat promised to be more than half (perhaps two-thirds) of a crop. On the whole, therefore, I think it may fairly be concluded, that these several attempts to produce a crop which shall (in part at least) reimburse the original cost of converting to pasture, have succeeded. But what is the expense? To enable us to ascertain this, we had better again refer to Mr Blaikie for particulars as to the labour required in the process.—'Arable land 'intended to be laid down for permanent pasture by the new 'method of transplanting turf, should be made thoroughly 'clean, in the first instance, by a clear-out summer-fallow, 'when the land is very foul; or by a turnip-fallow when it is 'not so.

* They turned out eight quarters and one bushel per acre.

'Suppose the land intended to be planted with turf to have 'had a clear-out summer-fallow, the operation of transplant- 'ing may be commenced in autumn, as soon as the turf which 'is intended to be removed for planting is sufficiently moisten- 'ed by the autumnal rains, so that it may be pared off clean, 'and without injury to the roots of the plants. It, however, 'seldom happens, that farmers can spare their labourers and 'teams for such operation, until the harvest is secured, and 'the wheat seed is put into the ground. The first week in No- 'vember may, therefore, be calculated upon as the time for 'commencing turf-planting.'

After enforcing the necessity of strict attention to the *quality* of the turf to be transplanted, Mr B. continues—'The field or 'pasture most proper for supplying plants being fixed upon, a 'paring-plough should be procured; or a common plough, with 'the coulter and share made very sharp, will answer the pur- 'pose: a wheel-plough is preferable to a swing-plough for par- 'ing turf, because it goes steadier, and cuts more regular. The 'turf should be cut about two inches and a half thick, and se- 'ven, eight, or nine inches wide, according to the nature of 'the turf, gauge of the plough, and width of the wing of the 'share. It is sometimes cross-cut into short lengths previous to 'the operation of paring; but this can only be effected when 'the turf is moist and free from stones. The cross-cutting is 'done by a scarifier with scimitar tines, the convex edges made 'very sharp and faced to the work, and the instrument heavily 'weighted, so as to press the tines a proper depth into the turf. 'The cross-cutting facilitates the operation of dividing the turf 'into small pieces; but it gives more trouble, and, consequent- 'ly, increases the expense of filling into the carts: for, when 'cut into small pieces, in the first instance, it requires to be 'filled with shovels; whereas, if left in large flags, it is readily 'filled with forks, or by hand, when the turf is tough and 'hangs together. The turf is taken on carts (if broad wheels 'so much the better) to the arable land on which it is to be 'planted, and then dragged out of the carts in heaps, set in 'straight lines, and at regular distances, and after the rate of 'fifty single-horse loads to the acre. It is then chopped into 'pieces of about three inches square, and spread with shovels 'regularly over the ground. A scarifier, with round or square 'tines, about one inch and a half diameter, and set about seven 'and a half apart, or four tines in a yard, is drawn regularly 'over the field, and again crossed at right angles, which takes 'out the cart-wheel tracks, levels the ground, and marks out the 'distances for placing the pieces of turf, or plants; but the oper- 'ation of scarifying is, of necessity, omitted when the ground

'is wet. The turf being spread, women and children are then 'employed to place or plant the turf, with the grass side up, 'one piece in each intersection formed by the tracks of the sca-'rifier; and, as the operators place the pieces of turf, they press 'them into the ground by setting their feet upon them. One acre 'of *turf*, divided in pieces, and placed as before described, will 'plant nine acres of arable.'

Mr Blaikie then goes on to show, that by making the intersections wider, and the pieces of turf smaller, the quantity of land that one acre will plant may be increased from nine to sixteen acres. 'The directions here given for paring and cutting the 'turf, are under a supposition that *the whole of the turf* is in-'tended to be taken from the grass field previous to its being 'broken up to undergo a course of aration. But if it should 'be wished to preserve the field as permanent grass land, in 'that case a sufficiency of turf plants should be left for the pur-'pose. The process is as follows.

'The gauge of the paring-plough may be set at nine inches, 'as before directed; but the wing of the share should be turn-'ed up at six inches, and, being made very sharp, will cut the 'turf on that side, while the coulter (also made sharp) will cut 'the turf on the other side; and the flat of the share will turn 'the turf out six inches wide, leaving ribs of grass three inches 'wide uncut. The cut turf being removed, the plough, set 'at the same gauge, is then drawn across the field at right angles 'to its former direction, and cross-cutting the previously uncut 'ribs, will leave patches of grass three inches square in each 'angle, consequently the same number of plants to the acre, 'as before stated, for transplanting. After the turf is remov-'ed, the field should have a good top-dressing, not less than 'thirty or forty cart-loads per acre of compost manure, or good 'vegetable mould. It should then be repeatedly well rolled. 'The turf will soon unite, and, in many instances, will be 'found materially improved from its former state, particularly 'so where the turf had been previously hidebound, or mossed. 'The turf may also be taken out of the grass field in narrow 'ribs, suppose three inches wide only, leaving three inches un-'cut; then, with a top-dressing of compost, and the ground 'thoroughly well rolled, the turf soon unites, and the herbage 'will be greatly improved.

'The transplanting having been completed according to the 'directions herein before given, no stock of any description 'should be admitted upon the young pasture in the first winter, 'nor, indeed, in the following spring or summer, until after 'the grasses have perfected and shed their seeds. If the trans-

'planted turf is found deficient of any particular species of favourite grass, such as white clover, permanent red clover, &c. &c., the seeds of those plants should be sown upon the young pasture in spring, but not too early. Clovers are tender plants. The latter part of April is a good time to sow their seeds: nor is it safe to sow them much earlier.' Repeated rollings, whenever the land is in a proper state, between wet and dry, are necessary to 'cause the plants to extend themselves along the ground.'

Having selected the most important passages relative to the operation, we next come to the expense per acre. Perhaps the most satisfactory document on this head is the one produced by Mr Blyth at the last sheep-shearing, and which I shall transcribe from a paper he gave me at that time.

	A.	R.	P.
Extent of grass land pared to produce plants for transplanting, the turf being clean pared off, -	1	2	18
Extent of arable land transplanted with the above turf, - - - - -	11	0	15

Expense.	*L.*	*s.*	*d.*
To ploughing or paring one acre, two roods, eighteen perches of turf, at 10s. per acre, - -	0	16	$1\frac{1}{2}$
To carriage of 600 loads of turf, fifty days' work for one horse, at 3s. per day, - -	7	10	0
To lads driving carts, one boy 14 days, at 1s. 2d., and one do. four days, at 10d. per day, -	0	19	8
To scarifying eleven acres, fifteen perches of ground, (when covered with turf cut in pieces), at 2s. 6d. per acre, - - - - -	1	7	$8\frac{3}{4}$
To labourers filling, cutting, spreading, and planting the turf on eleven acres, fifteen perches of land, at 30s. per acre, - - -	16	12	$9\frac{1}{4}$
Total expense, -	L.27	6	4
Total expense per acre, -	L.2	9	$2\frac{1}{4}$

On this statement, Mr Blaikie remarks very justly, that 'there is no allowance made for the expenses incurred by the clear out fallow of the arable land, nor of the year's rent, poor's rates, and taxes for that year; neither is there any charge made for restoring the land to its previous state, from whence the turf plants were taken; consequently, there may be a very considerable additional charge made against the transplanted pasture.' Mr Blyth took no corn crop with his transplanted

grass: But he is amply satisfied with the result of his attempt; and indeed he has reason; for, with the exception of a small part planted with a coarse kind of grass, (and which served to remind us of the necessity of caution in the choice of plants), the whole, when I saw it in 1817, looked beautifully, and does great credit to his enterprise and skill.

From what has been here said, I hope that my brother farmers in the North will discover, that this singular piece of husbandry is not so visionary as report may have led them to believe; and that the expense of the operation, though heavy in the first instance, may, thanks to Mr Coke, be considerably reduced, if not wholly reimbursed to the farmer, by sowing the land with corn, wheat, oats, or beans, as may best accord with the season in which the transplanting takes place. Another advantage peculiar to this mode of converting arable land to pasture (and a most important one), is, that good pasture may be produced (and that in a very short time) *upon land on which it is not possible to produce it by any other method.* Some lands will produce grass better than others; and where it can, without hazard, be obtained from seeds, there is no occasion to resort to transplanting. But are there not thousands of instances where, sow what you will, you cannot obtain from seeds, even after the lapse of *many* years, what this method will give you in *one*, namely, a good permanent pasture full of the best grasses? And why, it may be asked, cannot the same object be obtained by proper selections of seed? 'Because,' as the Editor of the Farmer's Journal very sensibly remarks, in transplantation, '*the soil in which they grow goes with* '*them.* Let it, says he, be considered, that, in producing per-'manent pasturage by transplantation, thirty cartloads per acre 'of rich surface soil are carried upon the sharp land that is to 'be improved, and are trampled into it in tufts regularly dis-'tributed, and the wonder will cease. Such a quantity would 'be an extreme top-dressing of any common manure, and must 'make a wonderful alteration on any piece of inferior grass land 'for a year or two; but, being soluble, it would wash away and 'be exhausted; but the earth just mentioned is fine, mellow, sur-'face soil, and is permanent.' This reasoning is correct, as far as it goes; though I have seen instances of turf being taken from the sides of roads, consequently very bare of soil, and which have nevertheless flourished and done well when transplanted, provided the turf has consisted of the right varieties of grasses. The earnest desire I have to set right any misconception that may have reached you as to the merits of this important discovery, and the wish I entertain, in common with many

of my countrymen, to do justice to those eminent agriculturists who have led the way in exhibiting it to the world, must plead my excuse for the unexpected length to which this letter is protracted. I remain, Sir, &c.

S. Taylor, junior.

Ditchingham, Norfolk,
October 5, 1818.

Holkham, Oct. 22.

P. S.—Being on a visit to this place, I am enabled to give you the latest intelligence of the appearance of the several experiments mentioned above. The part on which a crop of oats was taken with the transplanted turf, (amounting to 16 coombs 1 bushel per acre), though only a year and an half from the time it was laid to grass, now exhibits all the appearance of an old pasture ground. The interstices are completely filled up, and the surface perfectly level, and forming a mat of the finest grass. The other specimens are gradually uniting, but, on the whole, do not present so level a surface as the first mentioned; this, however, will soon be obtained, by rolling, and depasturing cattle. The wheat experiment did not succeed so well as I had imagined it would, when I viewed it in July—I mean as far as the *grain* was concerned. The turf has shed all its seeds, and the pieces are fast uniting. They were, however, too large at first; and, consequently, the field does not look so well to the eye as some of the others.

With regard to taking a wheat crop with transplanted turf, an idea has suggested itself to the active and intelligent mind of Mr Coke, which promises to be a considerable improvement. All corn crops hitherto taken with turf have been sown broadcast. Mr Coke intends to apply the drill to this work. Having prepared the surface of the land intended for transplanting, he proposes to drill a full seed of wheat, at twelve inches distance from row to row. In the intervals between these rows, he means to make grooves, or marks with the scarifier, or some such implement, in which grooves he plants a narrow strip of turf. The field will thus present a striped appearance, having a strip of grass and a strip of corn alternately. The wheat, it is supposed, will be a far better crop than if sown broadcast; and yet, being drilled at 12-inch intervals, will not interfere with the progress of the turf between, which, as the other experiments attest, will very soon unite. I can only add, that the several spots from whence the turf has been taken, are very little injured by the operation; indeed, Mr Coke is decidedly of opinion, that, so far from injuring, in nine cases out of ten, pasture will be benefited by the practice.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Experiment on Rape-Cake Dust used as Manure for Wheat.

SIR,—I have begged the enclosed note of an experiment, which I think may be of use, and send it for insertion in your Magazine.

Your, &c.

5th September, 1818. ——— CONTRIBUTOR.

Twelve contiguous ridges of summer-fallow were ribbed and sown on 6th October 1815 with Red Wheat, at the rate of two Winchester bushels per acre; the Rape-dust was then sown broadcast, and harrowed in, together with the Wheat. Price of cake and carriage, one shilling per stone of 14 lib. Ridges each above one-third of an acre.—From which the following calculations per acre have been deduced.

Ridges.	Cake Sown.	Bushels of Market Corn.	Weight per Bushel.	Secondary Corn.	Refuse.	Value of Market Corn.	Value of Secondary Corn.	Total Value of Corn.	Value of Oil-Cake.	Net Value of Corn.	Soil a Strong Gravel on a Clay subsoil.
Nos.	st. lib.		lib. oz.	lib. oz.	lib. oz.	L. s. d.	L. s. d.	L. s. d.	L. s. d	L. s. d.	
1 & 2	59 6	26.100	52 10	19 9	26 14	11 19 3	0 1 7½	12 0 10½	2 19 5	9 1 5½	
3 – 4	—	21.870	50 8	20 13	46 0	9 8 7½	0 1 8½	9 10 4	—	9 10 4	
5 – 6	86 4	28.040	53 4	19 1	16 0	13 1 1½	0 1 7	13 2 8½	4 6 3	8 16 5½	
7 – 8	—	22.840	51 2	50 11	40 3	10 0 9½	0 4 2½	10 5 0	—	10 5 0	
9 – 10	125 4	29.490	52 10	15 5	21 10	13 10 3	0 1 3¼	13 11 6¼	6 5 3	7 6 3½	
12	208 7	27.690	52 2	56 1	40 12	12 10 4½	0 4 8	12 15 0½	10 8 6	2 6 6½	

The Market Corn was valued at 10s. the Winchester bushel of 56 lib., deducting 3d. for every pound less.—The Secondary Corn, which was very poor, is reckoned at 1d. per lib. in all the experiments.—The Refuse could not be valued.

Observations during the Year.—24th Oct. No. 12. not appearing;—in general, the ridges without Cake most forward. —*Nov.* 1. No. 12, fuller plant, but paler than 11; and so were 9 & 10 compared with 7 & 8.—*May* 1816, Oil-cake ridges fuller and better coloured.—*14th July*, generally shot; ridges without cake not quite clear of the sheath. Reaped 14th October, stacked 19th. Thrashed No. 12, 25th Oct.;—Nos. 5, 6, 7, 8, 9 & 10, on 28th;—and Nos. 1, 2, 3 & 4, on 29th Oct.—Season very wet.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On Powdered Oyster Shells as a Manure.

SIR,

AN important discovery has recently been made in the preparation of oyster shells *as a manure*, the particulars of which, from respectable authority, I enclose, to be inserted in 'The Farmer's Magazine.' It is an article that has hitherto been much neglected in Scotland;—though it would seem well entitled to attention. The propriety of applying this manure depends much upon the different effects of mild and of caustic lime. It is well known that mild lime may be safely applied in cases where the land has been exhausted by the use of caustic lime; for instance, the scrapings of roads, made of limestone, though the caustic lime from that very stone would be injurious. Mild lime has been advantageously used, mixed with dung, for potatoes, and, instead of rendering them scabby, improves the crop. Mild lime may likewise be used in compost with dung-hills; and it does not, in that state, injure the dung, as caustic lime would do. Pounded oyster shells, consisting entirely of calcareous matter, would evidently be more useful than scrapings of roads or pounded limestone; more especially as, with the shells, there may be a small mixture of saline particles, or of animal matter.

I hope that some spirited agriculturists will be induced, from these hints, to try some experiments with powdered oyster or other shells; and to communicate the result to the public, in your valuable repository. I am, &c.

JOHN SINCLAIR.

Ormly Lodge, Ham Common, Surrey,
24th September, 1818.

Extract of a Letter from MR BLAIKIE of Holkham to SIR JOHN SINCLAIR, dated 18th September 1818.

"Oyster shells pounded or bruised, (without having been burned), were first used upon Mr Coke's farm, as a manure, in the year 1816. In the summer of that year, the experiment was tried upon a hungry, light, sandy soil, which had been cleaned for turnips. The oyster-shell dust, or powder, was drilled in the usual way, upon 27-inch ridges, at the rate of 40 bushels per acre, (without any other manure), was slightly covered with earth, and the turnip-seed sown upon it. Another part of the same field, quality of land equal, was manured with farm-yard dung at the rate of 8 tons per acre, put into the same-sized ridges,

and sown with turnip-seed as before described, (no other manure having been applied). The turnips proved a good crop on both pieces; nor were there any perceptible difference in the bulk, (but the produce was not weighed). The turnips were all ate upon the ground by sheep; and the succeeding crop, (barley), was good on both, and apparently equal: but the produce was not thrashed separate. The seeds, or *layer*, (crop of clover), in the present season (an. 1818), is a good plant, and appears equally so. It is eaten by sheep.

In this experiment, so far as it goes, it appears that 40 bushels of oyster-shell powder is equal in virtue as a manure, to 8 tons of farm-yard dung, at least for the purpose to which it was applied.

In the autumn of 1816, pounded oyster shells were tried as a manure for wheat, in competition with rape-cake powdered. The experiment was upon a one year's clover layer, the wheat sown after one ploughing—the soil a kind, light, gravelly loam. Oyster-shell powder, at the rate of 4 cwt. per acre, was drilled with the wheat seed on one part of the field, and, on another part, (of the same quality), rape-cake dust was drilled with the wheat at the same rate per acre as the shell powder: no other manure was applied to either part. The crop of wheat was good, nor was there any perceptible difference *upon the ground*; but the produce was not thrashed separate. A similar experiment was tried upon the same wheat field, *the manure applied at spring*. The operation as follows. The wheat seed was sown, *without any manure*, in the autumn of 1816; and in the spring of 1817, rape-cake dust, at the rate of 4 cwt. per acre, was *drilled* between the rows of wheat; at same time, an equal weight of shell-powder was applied in like manner to another part of the field. The result of this was similar to the autumn experiment, viz. there did not appear to be any difference in the crop produced upon the shell-manure from that on the rape-cake.

The field on which these experiments were tried, is now in turnips; a good crop, and exhibits no difference where the manures, as before stated, had been applied for the wheat crop.

These experiments are satisfactory, *so far as they go*, but certainly not conclusive; because the powder was, in no one instance, either weighed or measured: This I very much regret. But it appears to be almost impossible to conduct such experiments with a requisite degree of accuracy, upon a farm establishment of such magnitude as that of Mr Coke at this place. For, during the hurry and bustle incident to collecting the harvest, the farm-manager has so many important concerns to attend to, that he cannot devote any portion of his time to superintending

experimental objects; and, were he to depute the management of such concerns to the labourers, it is not to be expected that they would pay the attention requisite.

I believe Mr Coke intends to continue the experiments on oyster-shell manure, and to extend it to top-dressing for young clovers, permanent pasture, &c. &c.

The oyster shells are here broken to pieces by passing them through the oil-cake crusher; or are bruised by repeatedly drawing a heavy iron roller over them, when spread upon a stone or hard burned brick-*on-edge* floor.

I give it as an opinion, that oyster-shell manure is likely to answer for gardens, particularly to rake in with onions, and other small seeds. I also think it may prove beneficial as a top-dressing for grass plants, to destroy moss, and prevent worms from casting. If these ideas are well founded, there will be no difficulty in disposing of any quantity of this manure amongst the gardeners, and the citizens for their grass-plats in the vicinity of London.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Clover Seeds Saved in Scotland.

SIR,

IN the last Number of your Magazine, I observed an excellent communication on the raising of clover seed in Scotland, in which very forcible reasons are held out for inducing farmers to attempt the experiment, and explicit directions are given for conducting it.

It may be gratifying to your correspondent, and encouraging to many of your agricultural readers in this country to know, that the experiment has already been tried, and attended with such success, as to place its practicability beyond a doubt, on a farm situated on the north bank of the Carse of Gowrie. Indeed, it is something surprising, that the preserving of seed from a plant which offers two crops in one season, and the culture of which forms so prominent a part in farming, should not long ago have engaged the attention of the Scots farmer.

The farmers in this quarter generally begin to cut clover for their horses by the first of June; and if any part of the grass is more forward than another, that part is naturally first taken. The hay crop is seldom ready before the end of that month; and the latest grass on the farm is reserved for green food to the horses and cattle till the end of July or beginning of August, when that part which was first cut yields another crop ready for the scythe.

On the farm to which I allude, in the year 1815, on that part of the field where the grass had been first cut, the second crop began to assume a brown and ripe-like colour before the farmer had any occasion to use it; and the crop being light, it occurred to him that its produce in seed might be of more value than the green fodder; but, as the matter was problematical, he left only about 30 falls Scots measure. He found the seed ripe by the middle of September. The crop was cut down, dried, and carried to the barn-yard. In winter it was thrashed out and cleaned, nearly in the same manner as recommended by your correspondent. The produce was 1½ cwt. or about 8 cwt. per Scots acre. The same experiment was continued in 1816 and 1817; but, from the extreme lateness of both seasons, the result was less favourable. It must be observed, however, that the practice of taking a first crop in June, was more unfavourable to the ripening of the seed, than pasturing with sheep till some time in May, as recommended by your correspondent. It must also be observed, that the two last seasons were by no means favourable to the ripening of such seeds, even in England; but, had the matter been properly gone about this season, there are few farms south of the Grampians, (if we except some on the higher parts of Fife, and among the Seidlaw hills), where clover seed would not have come to perfection. As a sufficient proof of this, we have only to examine our clover fields this moment, where the first crop was only cut in the end of June, and it will appear, that many of the heads of clover contain purple-coloured and well ripened seeds. If this is the case, what might we have expected had we allowed the plants to have come forward from the middle of May?

I need say little about the disadvantages to which we are at present subjected by receiving our seeds through so many hands. Your correspondent has been abundantly explicit on that head; and the truth of his statements is felt experimentally by every farmer in this country. One thing, however, it may not be improper to mention, not only as a stimulus to induce us to raise our own seed, but also as a mean of detecting imposition, till we are able to obtain those seeds through channels where no temptation to deceive can exist.

There is a general complaint this season, (and indeed the ground of complaint has been of long standing), that yellow clover seed has been mixed with the red; and many intelligent farmers believe, that there is no possible means of detecting the imposition till the appearance of the plants expose the fraud. The difficulty, however, is more apparent than real; and though it may appear unaccountable, it is certainly true, that men who

can, at sight of a small sample of wheat or barley, tell the weight of a boll, even to a fraction, and who can readily distinguish between the varieties of Red-shank, Potatoe, and Common Blainslie oats, and the different varieties of wheat and barley, do still believe that they are unable to discriminate between seeds which do not belong even to the same genus. This must proceed from their not calling those powers into action which it is evident they possess.

It is well known to every botanist, that the parts of fructification of every plant bear a strong family likeness to that of every other plant belonging to the same genus. A general likeness also runs through all the flowers and seeds belonging to the same class and order of plants; but, in their minute parts, there is a striking difference, and a decided generic character by which each tribe is readily known. The Red, and what commonly goes under the name of Yellow clover, are plants not belonging to the same genus: the red clover is a Trifolium; the yellow, though it is also three-leaved, is a Medicago, and differs materially from all the Trifolium genus, in the general habit of the plant and its parts of fructification; and the seeds are in no other respects similar except in size or colour.

The seeds of red and white clover, are generally shining, flat, and shaped like the seeds of the laburnum tree. The eye is longish near the end of the seed, and is but slightly marked. The seeds of the yellow clover *(Medicago lupulina)* are rather dim, plump, shaped something like the kidney bean, with the eye near the middle, which is strongly marked with a deep brown spot, and a small brown spot below the eye, with a distinct bright yellow line proceeding from each side of the eye, and reaching half way to the end of the seed.

If you think the above worthy of a place in your Magazine, you may hear again from,

Sir, your obedient servant, G.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On Water and Air as the Food of Vegetables and Animals. By Dr J. Howison, *Crossburn-House, Douglas.*

Sir,

I have read with a good deal of interest the Rev. Mr Headrick's remarks on the effects ascribed by Sir H. Davy to the exportation of grain on the soil of a country, contained in your 73d Number; as also the strictures on these remarks by Pol-

Œconomicus in your Magazine for May last. My attention, however, was more particularly directed to his objections to Mr Headrick's theory, of water and air forming the principal part of the food of plants.

As it must be of much importance to agriculture that we do not remain ignorant regarding one of the first principles in vegetation, I shall here state some facts which came under my own observation as to water *directly* forming the food of both vegetables and animals; and at the same time, notice an experiment made by Mr Knight, which proves that animals have also the power of adding to their weight by the decomposition of air.

The learned Dr Lind, in his Essay on the Scurvy, remarks, that ships sailing in warm latitudes, by wetting blankets with fresh water, or spreading them on different parts of the ship during rain, and afterwards scattering over their surface cress and mustard seeds, that in 48 hours a great part of the ship may be covered with a delightful verdure like that of a garden, at the same time affording to the sick the most salutary refreshment. This I have often seen carried successfully into effect; and, during my last voyage to India, I for the same purpose placed, in a soup plate in my cabin, a conical piece of sponge, the base of which was nearly large enough to fill the hollow of the plate. Into this I poured fresh water until the sponge was sufficiently soaked, after which the seeds were strewed on its surface; by which means I was able to supply the table with a sallad every third day. In this climate, were a similar apparatus used in a room where a fire is kept during winter, a similar produce might be obtained. In further support of this opinion, I may state, that while resident at Prince of Wales's Island in the Straits of Malacca, I was in the habit of collecting various parasitical plants, many of which are remarkable for the fragrance of their flowers. These I suspended by a cord fixed to a rafter in the verhandah (piazza) of my bungalow, where they blossomed and brought their seed to perfection without any other nourishment than the moisture they absorbed from the atmosphere. The bulbous-rooted flowers which we every day see blown in pure water, are another proof of the power plants have of directly converting that element to their nourishment.

That animals have the power of decomposing water so as to live entirely thereon, has not been so generally admitted as with plants, from the difficulty of ascertaining it by experiment. What knowledge I possess on the subject, arose from the following circumstance. I have, for some years past, been in the practice, during spring, of putting into glasses, formerly used for blowing of flowers, a small quantity of the spawn of frogs, and

then filling them with water. These I place in a window, that I may more easily view the various and very interesting changes it undergoes before the frogs become perfect animals. So soon as they arrive at the tadpole state, they eat bits of tender meat greedily, with which I continue supplying them, as also with frequent changes of water, until they become frogs. I then am obliged to set them at liberty, from the danger they are in from drowning, their nature being completely altered. Being anxious to know if the tadpoles could live on water alone, I took care that, into some of the glasses, nothing but water taken from a covered well 31 feet deep should be given. Under this treatment, however, they became perfect frogs, but at a longer period, and were not more than a third of the size of those properly fed. They also continued to void excrementitious matter similar to the latter, but not in the same quantity.

Mr Knight's experiment, proving the power animals have of adding to their weight by the decomposition of air, was highly simple and satisfactory. Having placed in each scale of a balance a small piece of meat of equal weight, he put on *one* of the pieces a few eggs of the blue fly, and covered the whole with a glass receiver. He soon found that, in proportion as the maggots increased in size, the scale in which they were, preponderated.

I have been thus particular in establishing the above facts, as they may be of use in endeavouring to account for the great and continued fertility of Bengal, which both Mr H. and Pol-Œ. have, by mistake, ascribed to the overflowing of the Ganges, as the fertility of Egypt undoubtedly is owing to that of the Nile. On the contrary, the Ganges overflowing its banks is an event as much dreaded and guarded against as the breaking of the dykes by the sea is in Holland. * In Bengal, the inundations are of two kinds,—a circumstance which has not been sufficiently noticed in any of the accounts I have seen of this country, and which has led to the above error. The first may be termed the river-inundation, and has its origin in the melting of the snows which cover the mountains of Upper India, and the early rains which fall near the sources of the Ganges, by which that river is great-

* In August 1785, when stationed within a few miles of Moorshawdabad, I witnessed the bursting of the Ganges through its banks, which, although only partial, was the source of long continued misery and want to many thousands of inhabitants, the water having no outlet but by evaporation, until the river retired within its banks.

ly swollen before a drop of rain falls in Bengal. Its waters, from the time they enter this province, are carefully confined within its banks until they reach the sea, and only affect the low countries bordering thereon. The second may be called the land-inundation, which is produced by the heavy rains, occasioned by Bengal being situated immediately under the tropic, which annually commence about the middle of June, and continue, with little intermission, until the end of September. During this period, its extensive plains are covered with water, and the atmosphere is surcharged with moisture at a mean heat of 85°, which causes such a luxuriant vegetation and teeming with animal life as can only be believed by those who have witnessed it. To the putrid remains of these animal and vegetable productions, joined to the abundant moisture and heat, † are we to ascribe the inexhaustible fertility of Bengal, which, for ages past, has supplied with rice the deficiencies of Madras, Bombay, Persia, and even China, and not to the borrowed soil of Upper India. On the other hand, the fertility of Egypt, where little or no rain falls, must depend entirely on the overflowing of the Nile, without which that country must ever have remained a barren desert.

It appears that vegetation is the principal medium through which water and air are decomposed, and additions thereby made to the soil; for although animals seem likewise to possess that power, it is chiefly by living on vegetables, and on one another, that they afford their assistance.

This would lead to the discontinuance of naked fallows, after they are no longer necessary for the dissolution, by putrefaction, of the snails and worms, with the stems and roots of the plants which the fields contain; as, after that, a thousand years of fallow could not add the weight of a single grain to the soil, or one degree to its fertility. *

† Pol-Œconomicus is certainly mistaken, in supposing that heat gives little assistance to the decomposition of water by vegetables, when he says, page 164, 'The truth perhaps is, that water, simply such, no more serves every purpose in *hot* than in *temperate* regions of the globe; nor will it alone bring plants to perfection in the *torrid*, more than it will in the *frigid* zone.' What we have seen of its effects in the blowing of bulbous-rooted flowers and raising of sallads, when the plants had nothing but pure water to act upon, proves how much *heat* assists them in converting that element to their nourishment.

* That this theory has been long reduced to practice, is proved in the ploughing down of green crops as a manure. About eight years ago, during summer, I observed, that on part of a field belonging to me sown with oats, (but which had been so much exhausted, that

I shall close these remarks on the effects of vegetation upon water and air, with supposing, that, by volcanic influence, an island of diamond, or other indecomposible substance of an unequal surface, were raised from the bottom of the sea in a tropical latitude, and at a distance from land. It is then required, that a single grain of mustard-seed be placed in a crevice of the rock, exposed to the rain and sun. As to the probability of its germinating under these circumstances, and producing leaves, flowers and seeds, no reasonable objection will be offered. We may then fairly conclude, that the leaves would fall around the parent stem, forming a bed for the new seed to vegetate upon; thus going on in succession until, in time, the island was covered with vegetable mould to any depth required. After deducting the matter contained in the original mustard-seed, the remainder could have been derived from no other sources than water and air. It appears then, probable, that we owe the immense accumulation of vegetable earth with which our globe is at present covered, to the action of vegetation on water and air, and which may strictly be termed a new formation.

There is certainly, however, some difficulty even to imagine bounds to this consolidating power of vegetation, which, so far as our present views carry us, is sufficient to convert the whole waters of the ocean into dry land.

I shall, by way of conclusion, relate two instances, in which I observed Nature to have made a beautiful provision for the preservation of subjects noticed in this Essay.

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when cut, it scarcely returned the seed) the wild mustard grew with considerable luxuriance. Next season I had this portion of the field dug; and, to ensure a crop, ordered it to be sown in the beginning of March with wild mustard seed, which grew and blossomed about the 1st of June. This was then cut, and regularly buried during the second digging, and the ground again sown with the same seed. The second crop, which came into flower early in August, and was greatly stronger than the first, was, like it, cut down and buried; and a third sown, which proved heavier than the second, and, like the two former, was dug in, in October. Next year, without any other manure, this ground produced a fine crop of barley.

Wild mustard, on the light lands of this part of the country (Upper Ward of Lanarkshire), will grow a tolerable crop after they have been so much exhausted as to have ceased bearing corn. On light soils, where manure is scarce, I consider the mustard as an excellent medium through which to take it from the atmosphere,—that tribe of plants containing a large portion of ammonia, and growing on land so much worn out as not to bear any other crop.

In Bengal, the rice, which forms what is called the great crop, is raised in seed-beds during the dry season, on the borders of natural lakes, which are never without water. When the plants are pulled, a sufficiency are left to form a crop on the banks of these lakes; but as, on the setting in of the rains, the waters often rise with too great rapidity for the growth of the plants to keep pace with, Nature has wisely ordered, that the rice and other aquatics in these situations should not grow straight up from the bottom to the surface of the water, but in a very slanting direction, so that any sudden addition to the depth of the lake only raises the plants a little more to the perpendicular. Were the blades of the rice which float on the water to be covered for but a few hours, the plants would certainly die. In these places, the crop is always reaped from boats.

The *second* instance regards the spawn of frogs. From some resemblance in the habits of the turtle and frog, I had concluded, that the substance forming the beautiful transparent globe containing the dark blue spot, or embryo frog, in its centre, was intended by Nature for the nourishment of the tadpole, as that contained in the turtle's egg is for the young turtle. I however found, that its form and transparency only answered as a lens to concentrate the rays of the sun upon the embryo, and, by their heat, to bring it to life. The specific gravity of the spawn is also so exactly balanced with that of the water, as, in a medium temperature, to float half way betwixt the bottom and surface; and, by containing a few bubbles of air, when the sun shines it rises to the surface of the water, and, when the weather is cold, it sinks to the bottom of the pool. In two days from the tadpole's showing signs of life, it makes its way through its gelatinous covering into the water, after which it appears of no further use.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the Means of Preventing the Rust on Wheat.

SIR,

I WAS lately induced to draw up a paper on the means of preventing the *rust* on wheat, which has been printed in the Farmer's Journal, published in London; and I herewith send you a copy of it, which I should be glad to have inserted in '*The Farmer's Magazine*,' in hopes that it may induce some of your readers to try the experiment, how far salt will prevent the most destructive malady to which wheat is liable.

Wishing you much success in carrying on a publication so well calculated for the diffusion of agricultural knowledge,

I remain, Sir,

Your very obedient servant,

JOHN SINCLAIR.

Ormly Lodge, Ham Common, Surrey,
29th September, 1818.

N. B. It would be very desirable that the efficacy of salt, as a means of preventing the *Braxy*, or sickness in sheep, were fairly tried.—The process is a very simple one, merely giving the sheep large lumps to lick, or putting small quantities of salt, in a powdered state, on slates or stones accessible to them.

On the Means of Preventing the Rust on Wheat.

By SIR JOHN SINCLAIR.

THERE is, perhaps, no circumstance which, of late years, has produced more mischievous consequences to this country, than the frequency with which our crops of wheat have been infected with '*rust.*' By that destructive malady, the straw is not only covered with black spots (which are, in fact, a species of fungus or mushroom*), and rendered useless; but the grain itself is either partially or totally destroyed.

Nothing can be more dismal than to see a whole country subjected to this direful calamity; by which the expectations of the husbandman, to reap an abundant harvest, are *completely extinguished.*

Having witnessed such a distressing scene, on the banks of the Tweed and in other districts, in autumn 1808, I have been led, for several years past, to collect all the information in my power, both at home and abroad, in order, if possible, to discover, whether such a source of mischief could not be averted. That object is at last likely to be attained; and nothing remains, but to induce a number of farmers, cultivating different soils, and living in different parts of the country, to try the necessary experiments, to ascertain how far the plan, to be afterwards recommended, will not only occasionally, but whether it will not *uniformly*, succeed.

The great object is, to prevent that tendency to rottenness or corruption, which either causes or promotes the growth of this destructive fungus or mushroom. It is now pretty generally admitted, that the rust is, at least, partly owing to superabund-

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* The public at large are much indebted to Sir Joseph Banks for his attention to this subject, and the light he has thrown upon it.

ance of nourishment, and a too vigorous vegetation: * For, 1. Grain sown on the site of a dunghill is always rusted; 2. Wheat is less liable to this disorder, after the force of the dung has been spent on exhausting crops of rape or potatoes; and, 3. Luxuriant crops have been rusted, when, in fields immediately contiguous, where the ground was ill manured, and in poor condition, no rust was to be seen,

Various remedies have been tried for the prevention of rust: as, by steeping the seed in a solution of the sulphate of copper; —by cultivating rye with the wheat, to protect the latter from atmospheric influence;—by change of seed;—by sowing early, &c.: But the real means of prevention, *by the use of saline manures*, is a recent discovery.

In the course of a very minute investigation into the causes of the rust, undertaken in this country (an. 1808), and afterwards continued on the Continent at different periods, it appeared, 1. That rust was never experienced in the immediate vicinity of the sea, unless when the ground was greatly over manured; 2. That when sea-ooze was employed as a manure, impregnated as it is with saline particles, the rust was prevented; and, 3. That rust is little known in Flanders, where Dutch ashes, *full of salts*, are in use.

The utility of salt, however, for this purpose, has been confirmed by other evidence.

Mr Sickler, a farmer in Cornwall, and his neighbours, have found, by experience, that when they have used foul fishery salt as a manure for turnips, the succeeding crop of wheat was never affected by the rust or mildew. Salt, indeed, has been found an effectual preventive against rust, in land thus treated; while the adjoining fields, where no salt was used, were subject to that disease. This circumstance is fully confirmed by Dr Paris, in his evidence before the Salt Committee.—(Report, p. 30.)

These facts from Cornwall are strongly corroborated by a singular circumstance recorded by Parmentier.

It seems that, in the southern coasts of France, there are fields full of saline particles, on which the farmers sow, not only wheat, but at the same time the plant *saliçor*, from the ashes of which barilla is produced. In dry seasons, the salicor answers; for, without access to salt, it will not thrive; but in wet seasons, the wheat (the salt particles being in a great measure washed

* This doctrine is sanctioned by the authority of Parmentier, who ascribes the rust, ' à l'abondance d'un suc nourricier, resultant d'une vegetation trop vigoureux plutôt qu'aux brouillards, qui n'y ont aucune part directe.'—*Traité sur la Culture des Grains.*—Vol. ⅟. p. 242.

down) succeeds. Upon inquiring of Mr Silvestre, secretary to the Royal Society of Agriculture in Paris, whether the wheat produced on such lands was liable to disease, he replied, 'It is known, that in soils of this description, *the grain is not liable to rust or decay.*'

From analogy, this was to be expected. Salt is so great an enemy to corruption, that the wood employed in salt mines, to support the roof or sides of the mine, also the beams of wood in salt warehouses, remain undecayed for ages.* It is natural therefore to suppose, that salt, judiciously applied, will likewise prevent the injury which plants receive from the fungus tribe, or, in other words, *from rust.*

It is likewise the opinion of an able naturalist (M. Desmazieres of Lille), who has paid particular attention to the diseases of wheat, that the only chance there is of preventing the rust in wheat, is '*by applications to the soil;*' and, surely, of these, there is none so likely to be effectual as salt.

In the late Report of the Salt Committee, ordered to be printed on the 1st of June, 1818, various experiments are stated, in which salt has been used on fallows. One is highly favourable, the produce nearly treble in proportion to the rest of the field, and the grain of excellent quality. The succeeding crop of clover, also, was of a superior description. But it appears from the same Report, on the evidence of respectable individuals, that in three cases, salt applied to fallows was of no use as a manure. This contradictory evidence, however, is easily accounted for. In one experiment, only 16 tons of salt ashes were applied to three acres and a half (probably Cheshire acres) of fallowed land (see Report, p. 152.)—In another, the proportions are not stated (see Report, p. 162); but probably they were not so much as was necessary to ensure a favourable result; and in a third, the experiments were made with great accuracy, and the proportions are distinctly specified: But the highest quantities used were, 10 bushels 25 lib. in one case, and 12 bushels 21 lib. in another; whereas it is necessary to employ on fallows, from thirty to forty bushels of foul salt per statute acre, in order to obtain success.

The season is now at hand for making experiments with land to be fallowed. Those who wish to try them, should sow the salt they are to use in the months of September or October, in three proportions—30, 35 and 40 bushels of foul salt per statute acre, that the proper quantity may be ascertained. After it has remained for a few days on the surface, it should be

* Sir Thomas Bernard's Tract on Salt, p. 278.

ploughed in with a shallow furrow before winter; and afterwards thoroughly incorporated with the soil, before the wheat is sown in the course of the ensuing season. In making these experiments, the following particulars merit particular attention:—1. Whether the salt destroys weeds and insects? 2. Whether it makes the soil more friable, and less tough or adhesive? 3. Whether it produces an abundant crop of wheat, *free from rust or blight?* And, 4. What are the effects on the succeeding crop of clover, and the crops that follow it?

It would be very important to compare the land thus treated with an equal quantity of the same field *manured with lime*, stating the expense of each, and their relative produce, and what would have been the expense, had the salt been totally exempted from duty.

The loss of a single year, in ascertaining a question of great national importance, is so injurious to the public interest, that I earnestly hope a number of farmers will be induced to try the experiment in the course of this and the ensuing seasons. By the concurring testimonies of several respectable individuals, whether favourable or otherwise to the use of salt, the question respecting its utility, in preventing the ruinous effects of rust on our crops of wheat, will for ever be set at rest. It is a malady which has perhaps occasioned more distress to this country than any one other circumstance that can be mentioned. It is therefore the more desirable that such a source of mischief should, in future, be if possible obviated.

Ormly Lodge, Ham Common, Surrey,
10th September, 1818.

N. B. Any farmer who wishes to try this, or any other experiment with salt, for agricultural purposes, has only to send a certificate from any officer of Excise in his neighbourhood, specifying the quantity wanted, to any dealer in salt, in Cheshire or at Liverpool, by whom it will be forwarded for about 6*l.* per ton, free on board of any ship or canal-boat. The freight must depend on the distance from the place of embarkation to the place where it is to go.

Mr William Horne, a respectable and public-spirited merchant in Liverpool, is particularly anxious to promote such experiments; and, if applied to, will probably undertake to execute the commission.

EXCISE REGULATIONS.

A farmer requiring Rock Salt, ought to procure from the nearest Excise-officer, a certificate, of which the following is a copy.

No. 1.

A Certificate, to be given by an Officer, to enable a Farmer to procure Rock Salt for *feeding or mixing with the Food of Sheep and Cattle, &c.*

This is to certify, that is a farmer, residing at , in the county of near my residence, and that he now occupies about acres of land, situated at , and has not any certificate depending for Rock Salt already received.

Witness my hand, this day of 18

Officer of District *Divison or Ride. Collection.*

This document will enable him to receive the salt, any portion of which he may, if necessary, transfer to another farmer, and for which purpose the nearest Excise-officer will furnish him with a permit. He will also furnish him with another certificate, to be filled up when the salt has been used; and in which it is to be specified in what manner and proportions the salt has been used; what description or number of sheep and cattle have been fed therewith; in what way the same has been used as a manure; on what lands; and what benefits appear to have resulted therefrom. The permission to use the salt is not clogged with bonds or affidavits.

FOR THE FARMER'S MAGAZINE.

On the Use of Salt in feeding Cattle, and as a Manure.

From the Report of the Committee of the House of Commons on the Laws relative to the Salt Duties. 1st June, 1818.

In our 74th Number, page 200, (May 1818), in which we laid before our readers the substance of Sir Thomas Bernard's pamphlet on the Salt Duties, in so far as it related to agriculture, we took occasion to notice, that a Committee of the House of Commons was then engaged in taking evidence on this interesting subject. The Report of this Committee, with the Minutes of Evidence, has been recently printed by order of the House; and from this document, consisting of upwards of 200 folio pages, we shall endeavour to make such extracts as may be useful to agricultural readers. As there seems to be little or nothing to add to the experiments of Lord Somerville and Mr Curwen, in regard to the value of salt in the feeding of sheep and cattle, a point which, to a certain extent, appears unquestionable, it will be sufficient to confine our notices chiefly to its alleged value as a manure. On this head, the evidence is surprisingly discordant. In perusing the Minutes oftener

than once, our impression is, that there is nothing like a proof of the alleged efficacy of salt as a manure; on the contrary, some experiments are detailed which lead to an opposite conclusion. But there is a want of experiments on either side of the question. These may be now made at a very small expense, and without being exposed to any obstructions on the part of the Excise; the duties having been further reduced by an act passed last Session, on the suggestion of the Committee. The price of salt for these purposes, and the mode of obtaining it, are specified in the preceding communication.

It is curious to remark, that the Committee seem to think it a matter of great difficulty to induce farmers to depart, in any instance, from their established practice, or to enter upon a course of experiments, however easy and inexpensive. In this case, it is not required that a farmer should change his mode of culture, or his crops, or his implements. Nothing can be more simple than to scatter a few bushels of salt on his crops and pastures, either by itself, or mixed with his farm-yard manure, or in both ways; and to note its comparative effects. It is evident, from the following extracts, that it will be necessary to vary the quantity considerably; for the proper quantity is not only altogether uncertain, but it is probable the difference in the results may be chiefly owing to the quantity having been, in some cases, too large, and in others too small. Nor ought it to be forgotten, that the quality of the soil, and the kind of crops for which salt may be applied, merit particular attention. It is easy to reduce all these and other points to a tabular form, which may be filled up, from time to time, with very little trouble. We would suggest, that salt should not only be tried against land of the same quality manured in the ordinary way, but also against land not manured at all. If salt have any beneficial effect, it must be seen at once from this comparison. It cannot be doubted, that so many experiments will now be made as to settle the point. Any well authenticated details of these will always be acceptable, and meet with our earliest attention.

A pamphlet on this subject, written by Sir John Sinclair, has been circulated by the Highland Society of Scotland, who, as well as the Board of Agriculture, have offered premiums for experiments with salt. It will be found under the cover of the present Number, to which we request the attention of our readers. Sir John has done us the kindness to send the substance of this paper as a separate communication; but the Highland Society's pamphlet renders the insertion of it unnecessary.

We shall begin with one or two passages of the Report itself, from which the opinion of the Committee will be seen at once.

'Your Committee are strongly impressed with the great advantages that may be derived from the use of salt in feeding sheep and cattle, on the authority of Lord Somerville (a letter from whom has been exhibited in a part of the evidence), Mr Curwen, Sir John Sinclair, and Mr Arthur Young, whose statements on this point they recommend to the particular attention of the House, as the ground on which they instructed their Chairman to propose a bill, by which additional facilities might be afforded to the use of salt for this purpose, as well by a diminution of the duty, as relaxing the restriction under which it was granted by the act of last year. In their expectations from salt, applied as a manure, they are much less sanguine; yet believing it possible that, in some cases, and under some circumstances, it may prove beneficial, and feeling the importance of affording every fair chance for satisfactory experiment to ascertain its value in this respect, they have extended their recommendation to the allowing it on the same conditions for this and other agricultural purposes.'

'The principal increase of demand for salt which your Committee can venture to look to, in case of a considerable reduction of the duties, is in respect of sheep and cattle. The application of salt for this very beneficial purpose is general in many parts of the world; and the circumstance of its not being used in England, may principally be attributed to the excessive tax imposed on the article. The use of British salt in the Netherlands and in the United Provinces has been long known; and in Spain and Portugal also, its value is fully appreciated: It appears, therefore, not too much to presume, that what is frequently applied in other countries, at considerable expense of carriage, might be soon brought into general use by the more enlightened farmers in the United Kingdom. Should this happen, and the application of salt to agricultural purposes become general in the United Kingdom, it might ultimately so extend the consumption of it, as to enable Parliament, without any sacrifice of revenue, to make such a reduction in the duty as would destroy every temptation to fraud and evasion, remove every alleged grievance that is now ascribed to the Salt Laws, and furnish the means of realizing every advantage to the different classes of the community, and the great interests of the nation, which are dependent on the use of salt in the most unlimited extent.'

John Ayrton Paris, M. D., who has resided five years in Cornwall.

'Do you know any thing of salt being used as a manure in Cornwall?—The refuse salt is purchased by the farmers for that purpose; and there is generally a scramble for it, it is considered so desirable to attain it. The effect of it is certainly very striking; it seems to answer best, as far as my inquiries go, to green crops; for instance, to turnips and clover. To wheat and barley it produces a good effect; but it answers better, when applied in compost with other manure. I would beg to state one circumstance in addition, that where

wheat or barley has followed turnips, the land of which has been salted, the crop following has escaped the mildew; which has affected other lands immediately adjoining, on which salt had not been used.

'Can you speak as to the proportion?—The price that has been paid is tenpence a bushel.

'You are speaking of the refuse French salt?—Yes, the French salt employed: 30 Cornish bushels, of 84 pounds weight per bushel, or 60 Winchester bushels, will manure a Cornish acre.

'What difference is there in the Cornish acre?—It bears about the proportion of six to five to the statute acre.

'May not the beneficial influence of this salt depend upon the animal matter with which it is mixed?—Certainly not; for farmers find that that salt is to be preferred which has been used but once, and they give a superior price for it. That which has been used two or three times, and consequently contains much more animal matter, is considered very inferior.

'Do you know the comparative strength of pure and foul salt?—I can merely give a rough conjecture; it varies considerably in different parcels. I should think, speaking generally, it would be more than half impurity.

'Does that apply to the first using?—After the first using, which is that generally purchased for manure.

'It is sometimes sold, as it appears from what you have stated, after the first using, and sometimes after the second, and sometimes after the third; in what state do you speak of it now?—After being used once, I should think it contained not more than one half salt; I give it merely as a conjecture; I never made any experiments.

'Have you ever seen salt used independent of animal matter?—No.

'Then you cannot state the effects produced by it?—I can state one curious fact, that where salt has been spilt by accident, that an increased fertility is to be observed for many years.

'Is not the first consequence of that spilling of the salt an absolute destruction of the vegetation?—It seems to suspend the vegetation, but not to destroy it. With the permission of the Committee, I will illustrate this by one fact. A farmer attempted to get rid of the docks upon his estate by salting them. He cut down the dock, and then put a great quantity of salt upon its stump. The effect was, that, for a year, the weed disappeared altogether, and he conceived he had destroyed it; but the following year, instead of a dwarf, which it was formerly, it sprung up as a giant.

'You have stated, that in some cases it was necessary to mix refuse salt with compost, to make it effectual?—Yes, it appears to be the case, that it answers better to wheat and barley, when so applied; that it is more successful in fertilizing, than when sown with seed.

'Does not that lead you to believe it may be essential that it should

be mixed with some other material?—The only conclusion that can be drawn, is that which is necessarily drawn from experience. We cannot reason, in the present state of our knowledge, with respect to the application of salt, except by facts; and the facts I have stated are, that to green crops it answers better when sown, and to other crops when in compost.

'You say, when sown. Is the refuse salt then thrown into the ground with the seed?—Yes.

'In the quantity stated?—Yes.

'Have you seen it used in those proportions?—Yes.

'It gives you about 30 bushels of clear salt?—Supposing my data to be accurate, it does.

'Have you seen it used to a great extent?—No; I have seen enough to satisfy me that it may be used very beneficially.

'Have you seen it used to such an extent as to justify any general conclusion?—My impression about it is, that it is extremely useful as an article of manure in Cornwall.

'What is the sort of soil; is it strong or light?—I feel a difficulty in defining the soil; it was a clayey soil where I saw the turnips growing; and in a neighbouring field that was not salted, and where turnips were growing, the crop was good for nothing.' p. 30—32.

Arthur Young, Esq. Secretary to the Board of Agriculture, has tried salt for almost every crop. Some of the experiments were doubtful in the result, others very striking. Its effect seemed to depend, in some measure, upon the weather; and he thinks it was better upon dry soils, and when wet followed its application. The quantities varied from one bushel to four bushels per acre; and it was sometimes sown along with wheat, and sometimes over it, in the spring. Four bushels he thinks too much. The advantages that would accrue from the use of salt by sheep, cattle, and horses, over the kingdom, he estimates at 3,082,350*l.*; being 6s. a head on sheep, 7s. on cattle, and 10s. on horses.

The following judicious letter, written by a most respectable farmer, was delivered in to the Committee by Mr Curwen, one of its members. So far as it goes, it is exceedingly satisfactory in regard to the value of salt in the feeding of cattle.

'Dear Sir, *St Helen's, April 10th*, 1818.

'According to your desire I went over to the Schoose Farm last Friday to view your stock, and to make a report of the supposed advantages to be derived from giving animals fed on green food a proportion of salt along with it. Having had an opportunity of viewing your stock about this time last year, and also during the summer and autumn prior to your beginning this plan, I am enabled to point out, in a great measure, the advantages to be derived

from it; for, certainly, every animal, according to its respective age, is much better in condition than at this period of the spring last year; and to my knowledge, the stock were fed precisely in the same way, except that of giving them the proportion of salt;—and according to Wm. Glover's statement, they have been much less subject to disorders. From the experience I myself have had for twenty-six years past, in the greatest and highest bred stocks of short horns in the counties of Northumberland and Durham, I can safely say I never saw so many in such high condition as they are; from the oldest cows and oxen taken off work, to yearlings and calves, they are all in the most thriving state, and fit for the shambles. I very much regret that some have not been fed without the salt, as the advantages would have appeared more clearly from the contrast; but it is not yet too late, as one or two of the yearlings and two-year olds may have their salt taken from them, which, by your return home, would show the difference. My own sentiments with regard to salt are, that, in itself, it does not possess any fattening qualities; but as a means of creating appetite, and assisting the digestion, it may be employed to very great advantage, and more particularly where green food is given to cattle in summer, or a large portion of turnips in winter: But a little more experience is required before I can decidedly speak as to its advantages; though, so far as the experiment has gone, it appears very striking, and the use of it ought to be encouraged. The benefit to sheep has long been known and admitted; and, reasoning from analogy, there can be little doubt of its advantage to large cattle also; but so long as the difficulties with regard to bonds, &c. in procuring, and the jealousies of the Excise of its being improperly applied, exist, no person who values his own quiet will enter into the bonds necessary for that purpose, or wish to have it in his possession, if there is a power left to any petty exciseman to harass and vex him about it; so that, however advantageous the use may be, the present bar must be entirely done away with before it can be brought into general use and benefit to agriculture.

'I remain, dear Sir,

'Your most obedient humble servant,

'*J. C. Curwen, Esq.* 'ROBT. THOMPSON.'

Mr JAMES MANLEY, a farmer residing at Anderton in Cheshire.

'Are you aware of the use of salt in agriculture, and have you tried any experiments as to its use?—I have tried it in my own garden upon onion-land.

'Is it very serviceable?—Yes; we use it every year, if we can get it.

'Have you tried it upon potatoes?—We have a man, who lives on the Bank, who has tried it: he puts 4 or 5 cwt. of refuse salt on his land.

'How much land has he? Ten Cheshire roods, equal to 20 statute roods.

'Have you ever tried the use of salt in marling ground, by using brine instead of water in getting marl?—Yes, I have a marl field of 8 statute acres: in one part of the field, marl was got with brine, and in another part of the field it was got with water.

'Can you state the difference of the land which you marled with brine and that which you marled with water?—It was as much as five bushels to a statute acre more in that produced by brine than that produced by water.

'What was this crop?—Wheat.

'Have you tried it on grass land?—Not much; I have not had an opportunity.

'Have you tried it at all?—I have not.

'Have you any knowledge of the salt leys, where they use the brine to irrigate the fields, to force the grass?—I know Nantwich Ley, where they do that, and have known it forty years.

'Is not that floated, by a forcing-pump throwing the brine over the ground?—Yes, every autumn.

'Is the pasture upon that ley looked upon as particularly good?—Yes.

'Are not horses and other cattle very often sent to run on that ley?—Yes.

'And is not the price of the ley much higher than on other land?—It is double.

'For what reason do you conclude that the value of the ley has increased?—It is called the Salt Ley, by using the brine to it; and they send their cattle there to run, and horses that are lame or ill: they send them to it as to an hospital, to physic them.

'Can you speak to the use of salt with sheep or cattle?—I know a farmer of the name of Sutton, who uses it for his sheep and an old favourite horse.

'Have you understood his flock have been better since he has used salt, and have they been freer from the rot?—Yes; he told me last week he attributed it to salt only that has saved them from the rot.

'How long has he used it?—Three or four years.

'Do you know of its use in hay which has been damaged, to make it a palatable food to animals?—Mr Marshall, of Northwich, buys ten bushels every year to put into his hay.

'Whether damaged or not?—Yes; he has done it for years.

'You have stated, that there are 5 libs. of salt used in half a hundred weight of cheese?—Yes, there are.

'Are you of opinion that that adds at all to the weight of the cheese?—No, to the contrary; it drys all the butter out of the cheese, and all the moisture; wherever the salt comes, it drives out the moisture, if it is overdone.

'Do you mean, if it is properly done, it lightens the cheese?—Yes, by expelling the moisture from the cheese.

'If it is overdone, it spoils it?—Yes.'

Part of this evidence seems to be in direct opposition to the statement of another witness, Mr THOMAS BARKER, a salt proprietor and manufacturer at Northwich.

'Do you know any thing of the use of brine on the Salt Ley at Nantwich?—There is no such thing.

'How is the land dressed?—It is irrigated from the water that runs out of the town; there was no brine ran on it, or near it; it is the best pasture we have, and, of course, lets for more money for diseased horses.'

The Right Hon. Sir JOHN SINCLAIR, Baronet.

'One of the most important uses of salt, as connected with agriculture, is, that it preserves seed when sown from the attacks of the grub. This has long been the practice in some of the western districts of Scotland; and, from the great destruction the crops of oats received from the grub, it has lately been revived. Observing an account of it in a Scots newspaper, I wrote to the Earl of Hopeton the Lord Lieutenant of West Lothian, in whose district the practice had been tried, to know the effect; and he sent me a letter the other day, from which it appears, that it has been attended with great success; and that, in the cold districts in the west of Scotland, its effects are considered to be so very great, that few of the farmers have omitted it this season.'

'I would also mention one other particular, which is with regard to the benefit of salt to oily seeds. It was first discovered in America, in the culture of flax, and has since been ascertained in this country by the experiments of Mr Lee of Old Ford, near Bow in Middlesex, who tried it at my desire. The quantity of salt should be the same as that of the seed sown, namely, about three bushels per English acre. It should be strewed on the surface after the seed has been sown. It improves greatly the quantity and quality of the flax, and, in particular, the quantity of the seed from the new crop. It is thence conjectured it would be of use in other seeds of an oily quality.'

We shall now submit evidence of an opposite description.

Mr BRYAN SHAW HILDITCH, a farmer at Petston, near Sandbatch, in Cheshire.

'Have you tried several experiments on your farm, in the use of salt as a manure?—I have.

'Be so good as to state what those experiments were, and the result of them?—I have tried it twice only; once about seven years ago, as near as I can recollect. I procured five cart-loads of refuse salt mixed with ashes. I spread it upon a piece of land which I had in summer-fallow, intended to be sown with wheat, and I had it sown accordingly; the result of which was a very middling crop. I suppose that was upon about an acre and a half to two statute acres. This produced me, as far as I can recollect, about from eighteen to twenty Winchester bushels to an acre; from the expense of a sum-

mer fallow, it ought to have produced from twenty-five to thirty, considering the kind of land.

'If it had had a coat of dung upon it, in the ordinary course, you mean to say?—Yes, or manured with a coat of lime.

'Have you not used it also for turnips?—In consequence of this not succeeding to my wish or expectation, I never used it again; till, last year, I was induced to attempt it again, in consequence of what I heard spoken of, that Government was going to take part of the duties off, to enable it to be used as a manure.

'State the particulars of the last experiment?—It was land that was going for turnips; and I procured one load of this refuse salt, as good as I dare take, for I was apprehensive of the exciseman. It was better than I had before; and I had it spread upon what I judged to be a quarter of an acre statute measure, about two months, or, it might be, three months previous to sowing the turnip, (for I was apprehensive it would entirely destroy the seed), to give it time to mix with the soil. This I caused to be sown with Yellow Swede turnip seed, and the Common White turnip seed. The Swede turnip produced almost next to nothing; they were very small, very little larger than potatoes. The White turnip seed was a great deal better; though I ought to have stated, that, in the same field, I had about three acres sown in the common drill way with manure, which is used usually for turnips; and the crop was a fair average crop, both of the Swede and the White. The White turnip seed which was sown on the salted land, though considerably better than the Swede upon the same land, was considerably inferior to the crop grown from common manure. This is the result of the two experiments I have made.

'Was the crop of turnips at all eaten by the fly?—It was not; that is the advantage I observed.

'The part which was manured with salt did not suffer so much with the fly?—No.

'Was the other part of the field that was not manured with salt, eaten by the fly?—It was attacked by the fly, but did not suffer much.'

The following extract is rather too long; but, as far as the authority of the writer goes, it is the most interesting of all. It is, indeed, the only part of the Minutes that has any claim to the character of experimental details, on this branch of the subject.

Mr Joseph Fenna, a farmer of Cheshire.

'Have you had occasion to make any experiments with salt, as a manure?—I have, under the direction of the Board of Agriculture. I have tried many experiments twenty years ago; not lately.

'Those were made under the direction of the Board of Agriculture?—They were suggested by the President, and done according

to his direction; and every thing I could think of that was likely to ascertain the value of salt as a manure, was done.

'Do you happen to have with you a detailed account of the mode of trying those experiments, and the result?—I have.

'Deliver it in.

[It was delivered in, and read, as follows.]

Experiments with Salt, by JOSEPH FENNA.

On Fallow.

'July 1st, 1797. Experiments on a fallow for wheat, being once ploughed, and that before Christmas last, full of grass and weeds, owing to the continual wet weather.

	A.	R.	P.		lib.			bush.	lib.	
3 butts - -	0	2	4	sown with	85½	of salt, that is	-	2	50	per acre.
2 ditto adjoining	0	1	26	unsown.						
3 next adjoining	0	2	35	sown with	89	- ditto	- -	2	11	—
2 ditto - -	0	1	35	unsown.						
3 ditto - -	0	2	5	sown with	130	- ditto	- -	4	20	—
2 ditto - -	0	1	13	unsown.						
3 ditto - -	0	1	34	sown with	193	- ditto	- -	7	25	—
3 ditto - -	0	1	7	unsown.						
3 ditto - -	0	1	34	sown with	175	- ditto	- -	6	42	—
3 ditto - -	0	1	17	unsown.						
3 ditto - -	0	1	13	sown with	195	- ditto	- -	10	25	—

'*Observations.*—July 12th, 1797. Some few of the weeds have perished; but no other evident alteration, compared with those unsown, and none at all upon those sown with small quantities. Ploughed under between the 7th and 14th July, the weather being rather drying, but still showery.

'July 12th. Salt sown on the same fallow, being twice ploughed, the weather drying—

	A.	R.	P.		lib.			bush.	lib.	
1 butt -	0	0	22	sown with	76¼	of salt, that is	-	9	49	per acre.
1 ditto -	0	0	18	-	78¾	- -	-	12	21	—
1 ditto -	0	0	33	-	109	- -	-	9	34	—

'*Observations.*—Some few snails perished by the application the day following. No other perceptible alteration has yet taken place.—Aug. 28. Has been harrowed and ploughed a third time.

'A man sowing from a seed-hopper, common stride and full hand, twice over the same ground, will sow from 10 to 12 bushels per acre.—October 1st, 1797. Sowed another butt in the same fallow, immediately before its being sown with wheat, and ploughed in therewith, being 10 bushels per acre.

'No visible advantage has been seen in any of the above through the winter or at spring, nor any perceptible advantage as the crop advanced to maturity; neither could the reapers, nor any other viewers, distinguish the least appearance in favour of salt, compared with the butts unsalted.

On Pasture.

'June 30th. Sowed 17 perches of pasture with 4 lib. ¾ oz. of salt (being rye-grass and clover, of the second year's growth, soil pretty good, upon marl). Sowed 13 perches with salt (3 lib. 12 oz.)

being pasture of several years growth, full of wild or natural clover; soil deeper, and warmer than the former.

'July 1st. Sowed 35 perches with 17¼ lib. of salt, being pasture of the third year's growth; soil open, upon sand, productive of fern.

'December 1st, 1797. Sowed part of a butt with salt, after the rate of *fifteen bushels* per acre.

'December 1st. Sowed 8 lib. of salt on part of a rough meadow, having nearly its whole summer's growth of sour grass, which the cattle would not eat, and has been usually burnt off at spring.

'*Observations.*—July 12th. No evident alteration, compared with the adjoining land.—August 28th. Continues unaltered.—In spring, 1798. Not forwarder, nor anywise preferable to the adjoining butts of ground, which were not salted.

'Some thistles and some little of the fern damaged, but not destroyed; the rough or sour grass being in a withered or dead state. Though sown with fine salt, when dewy, was not affected thereby; neither did the cattle prefer it to the other not salted.

On Hay Grounds.

'July 27th. Sowed 29½ lib. of salt upon 14 perches; a cold, peaty meadow (herbage indifferent, intermixed with rushes), immediately after the hay being carried off, the weather dry.—[N. B. Eight bushels per acre].

'*Observations.*—July 29th. The weather broke, and much rain has since followed; but no visible alteration has yet taken place.—August 27. This is not a sufficient quantity to destroy the herbage, nor has any advantage yet appeared; neither has the spring nor the crop of hay-grass shown any thing preferable to the unsalted parts adjoining.

On Hay.

'August 13th. Scattered 3 lib. of salt in a ton of hay, at the time of housing, being a little weathered. This hay appeared less mouldy, and, on that account, was better than the same unsalted; but would not compare with the like hay which had not been weathered and not salted.

On Weeds, &c.

'June 30th, 1797. Applied 4 oz. of salt to 4 weed-wiss (in Gerard's History of Plants, called *genistella tinctoris*, dyer's weed, or bastard broom), tufts or roots, occupying a space 12 inches * in diameter, in equal quantities; the ground being wet, with almost continual rains, for a month past.

'*Observations.*—July 1st. Began to droop.—July 12. Dead.—August 28. Three of them are rotted away, and their place growing over with grass; the other has its woody substance yet standing, though dead. These sprang up from the old roots (1798), and have continued in the same flourishing state as they were before the application of salt (July 1798).

* 194 bushels per acre.

'1797. July 1st. Applied 7 lib. of salt to a number of the hard kinds of rush-tufts or bogs in the pasture.

'*Observations.*—The cows found it the next day, and collected as much as they could together, with every blade of grass growing amongst the rushes. Some few of the rushes were bit off in consequence of the search; the remainder did not die nor suffer any apparent damage from the application.—August 28. It has been found, by subsequent trials, that the cows take this in the act of licking the grains of salt with their tongues, and that, where the grains have been dissolved, the herbage is not preferable on account of its having been salted.

'1797. July 12. Ten lib. were used upon a poor furze or gorsey bank, chiefly clay sod, being then almost totally overgrown, 12 or 16 inches high, in quantity about 80 square yards; the weather dry.

'*Observations.*—The cows found this, and stole all that they could get at, together with any decent herbage with which it was intermixed. Some little of the gorse has perished, but is far from being destroyed, August. The whole recovers at the return of spring (1798), and so continues.

'July 12, 1797. Used 8 lib. of salt upon a number of weed-wiss or bastard broom-tufts or roots (the four salted the 30th ult. being dead), the weather dry.

'*Observations.*—July 27th. They are in part destroyed. The cows found this, and collected as much as they possibly could without eating the weed, which is very bitter.

N. B.—These retained their verdure longer than those salted in wet weather. August 28. Not yet destroyed, but much hurt. These, like the former, recovered at spring 1798, and so continue (July 1798).

'1797. July 12th. Used 10 lib. of salt upon more rush-tufts or roots in the pasture, a greater quantity to each.

'*Observations.*—The cows found it in a short time, and selected every grass from amongst the rushes, together with as much of the salt as they could. Some of the rushes suffered in the pursuit, being bitten off and thinned.—August 28th. The rush-roots are too deep to be destroyed; grass, and other herbage near, has suffered. These, in 1798, are not to be distinguished from the others not salted.

'1797. August 25.—Used 6 lib. upon 15 square yards of ground, almost totally overgrown with hen-gorse, (in Gerard's History of Plants called *ononis sive resta*, cammock, or rest-harrow), a pernicious woody shrub, infesting clay soils, being then in full flower, and beginning to set its seed-pods; the weather showery.

'*Observations.*—August 28th. The leaves of the flowers are dying. The branches died soon after; but the roots sent out fresh ones at the return of spring, which still continue. This being upwards of thirty bushels to the acre, destroyed the intermixed grass, which became brown and lifeless till the approach of winter, when it began to recover, and the whole was recovered by the spring; but no better herbage than the adjoining; nor has it any time since been preferable.

'July 1798. This quantity was not sufficient to leave the ground quite bare; though the herbage was killed, it never totally disappeared. If a lesser quantity would have done so, it might have been serviceable for destroying the sward, previous to the making of a ley fallow. Salt has been used from 15 to 20 bushels per acre upon small patches of nettles in deep-soiled pasture, which were fretted a while, but afterwards recovered without any visible alteration.

'It has likewise been tried in 1798, in various proportions and at different times, upon a turnip fallow, without any good effect. It was sown upon a weedy part of the turnips, to the amount of 10 bushels per acre, after they were up in three or four rough leaves. These were fretted; but the greatest part of both weeds and turnips recovered, with little variation from the other (rather worse if either). How salt would act upon worms, or what is called the fly, is not known, as the crops were not plagued with them this last year. Probably it would have a good effect; for salt was tried upon worms on a gooseberry bush, without fretting the tree much. The worms soon after died; but as this was only one instance, perhaps a change of weather, or some other cause, might occasion their death. This experiment is intended to be repeated both on turnips and gooseberries.

'With cut straw salt has been tried mixed, and immediately given, put together and left to ferment, and sprinkled with salt and water. In every case it is refused by the cattle.

'Salt mixed with dung, in various proportions and in different sorts, is not discoverable from the same sort set on without salt. On the 3d of January 1798, 67 lib. of salt were mixed in two square yards of tough peaty parings, cut from the sides and bottom of an open peaty drain, and made in a heap of that size. The remainder of the same parings were mixed in another heap, and mixed up with a quantity of horse-dung of proportionate value, allowing the salt to be worth 6d. per bushel, and the dung to be worth 2s. per square yard. Both sorts were examined by Sir Robert S. Cotton, the beginning of August last, at which time the admixture with salt remained in a dead tough state, without any rotten or saponaceous particle in it. The blades of grass in the middle of the heap, though dead, had not lost their colour. No weeds or any vegetable had grown upon this heap; but the other, mixed with dung, was covered with weeds, and, on opening, was found much reduced and pulverized, and, after one good turning and mixing, was set upon the ground in good condition in November last: the other has since been twice turned, and remains in a heap unrotted to this day, March 1799. From hence it may be concluded, that salt acts not as a septic on vegetable substances, but, on the contrary, preserves them in a dead state, and acts as a preventive to putrefaction. This is perhaps more fully proved by the common method of preserving kidney or french beans, when ripe enough for the table, which are kept the year round for culinary purposes, in pots, between layers of dry salt.

'In all the different trials of sheep, both with salt scattered in different parts of their pasture, and salt and water sprinkled upon other parts, their attention could not be attracted more than smelling to it and quitting the place: Perhaps the notice that cows pay it is chiefly owing to the custom of strewing salt upon the calves as soon as calved, which is commonly licked by the cow, more perhaps from a mother's fondness, than the salt. Some cows refuse to lick them; but most will do so, whether salted or not. Whether this custom is practised from any good purpose, cannot be ascertained.

'From the foregoing experiments, it may be concluded, that salt may be of service to agriculture in the preparation of fallows in rainy seasons, unfavourable to the plough; but, in this case, great quantities must be used to have the desired effect; perhaps less than 50 bushels to each acre would be insufficient. This quantity would not destroy vegetation for more than two months, as appears from the first experiment with weed-wiss, where something more than that quantity was used. This quantity might destroy the weeds, but would not reduce it, if in a rough or soddy state, as appears from the last experiment in manure, where the quantity used is equal to 240 bushels per acre, allowing it to penetrate the surface of the fallow in equal degree only three inches deep.

'Perhaps it would be more beneficial, used in small quantities with hay at the time of housing or stacking, which, if weathered or damp, might prevent it in some degree from moulding; and if green, and in large quantities, might act as a preventive to overheating and firing. As an assistant or stimulus to the vegetable system, it appears, through all the foregoing experiments, to be quite destitute of every good property, and unworthy of notice as a manure in any kind of process.

'Such is the opinion of several neighbouring farmers who have viewed the different applications, who have, without exception, concurred in this report.

'I am, Sir, your very humble servant,

'*Blackhurst*, 16*th April* 1799. 'Jos. Fenna.'

These experiments seem to relate to salt in an unmixed state. Another document, with which we shall conclude this article, describes the effect of the ashes of salt works, and was delivered in to the Committee by Mr Thomas Marshall, a salt manufacturer at Northwich, whose own evidence is also hostile to the use of salt as manure, and not favourable to its employment in feeding live stock. Mr Marshall admits that it renders damaged hay more palatable to cattle.

'Dear Sir, *Ashton, Warrington*, 30*th April*, 1818.

'I promised to give you some account of my experiments of manuring with salt. It is nine or ten years ago that I sent two sand-riddles to my salt works, and ordered the workmen to riddle the ashes out of the cinders every morning when they cleaned the furnaces under the pans, and to this put the sweepings of the pan-houses

after the salt was warehoused (we all know coal-ashes, when riddled fine, are a manure for grass land.) I had about twenty-five tons of this mixture brought here by one of my salt-flats, when coming for coals: It was rather strong of the salt; but I put all the dung, and manure of all kinds, from the cows, horses, &c. besides about twenty loads of ditchings. I laid the salt-ashes in layers amongst this, and turned it several times over, till it was very mellow and fine, when I put it on about nine statute acres of meadow land, in our undivided townfield. I think it might be altogether about 100 tons, and, without the salt, would have given me very great crops; instead of which, the first year, it looked very poor and sickly; and though it was better every succeeding year, it never looked as well as my neighbours till it was again manured. I had a good opportunity of making the comparison, as my land lay in twenty different lots all over the field. The space where it was turned over I digged, and set with potatoes; the first year there was scarcely a potato. I set it a second, and a third time. The second time, the stems were about as thick as a quill, and very few potatoes. The third year by no means good, when I sowed it with grass seeds; but, to this day, it is scarcely as good as the land round it. This has convinced me there is no manure in salt. But I have further proof by my tenant Thomas Eaton, as also several other farmers in Barnton, who, seeing my mixture, asked me leave to use my riddles, which I gave them, and considerable quantities were riddled, till my riddles were worn out; but I observed they never came a second time; and when I inquired why they did not, they answered me, "No more salt!" Some few years after my experiment, I was going to Liverpool; and in a field by the road-side, belonging to the British Plate Glass Manufactory, was a crop of potatoes, which looked very puny and weak, and so much like some of mine, that I suspected they were salted. I had an opportunity of seeing their bailiff or farmer, who confirmed my suspicions; and on inquiry how he liked it, he answered me as the others, "No more salt!" I consider my own experiment sufficiently convincing to me; but, after seeing the above potatoe crop, nothing can ever induce me to use salt again as a manure. But I might further add, that the field belonging to the Glass Company was sown with wheat, after the potatoes; and the wheat crop was by no means such a one as, from the high state of cultivation their land always is in, they had a right to expect; and I have no doubt was injured by the salt.

'I have given you these observations of mine: but I have no doubt you have not been so long a practical farmer, as well as a salt proprietor, but you must know what I have said is correct.

'My dear Sir, yours most truly,

'JOHN WHITBY.'

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On the various Measures used for Grain in Scotland.

SIR,

In your Magazine for November 1816, a correspondent gives a Table of the differences betwixt the Linlithgow boll and those in use in the several counties of Scotland, copied from Lord Swinton's work on the subject of weights and measures. He has likewise, with great correctness, formed a series of Tables for ascertaining the relative quantities of meal produced from grain of every different weight, from 10 to 16 stone per boll; by referring which Tables to the Table of Differences above alluded to, he asserts, a very close approximation may be made to the quantity of meal which ought to be produced from a boll of oats of any given weight, and according to any of the county measures.

From the accuracy with which your correspondent has drawn up these Tables, it is extremely to be regretted that Lord Swinton's Table of Differences is so far from correct, as to render his otherways important exertions quite nugatory in many counties. I shall only at present mention our own county measure, which is stated to be, to the Linlithgow boll, as 111.483 is to 100; whereas, in fact, it is only as 104.3 is to 100:—being an error of above 7 per cent., or rather, making the excess nearly three times as much as it really is:—thus at once doing away with the general use of these truly valuable Tables, till such time as a correct statement can be made out of the different county measures. As an additional proof of Lord Swinton's incorrectness, I may here mention, that he states the Nairn boll to exceed the Elgin or Morayshire by 6.227; whereas, in fact, it falls short of it by the difference between 4.3 and 5.256. These errors certainly afford presumptive evidence, that similar ones extend through the whole Table.

Such being the facts of the case, Sir, I would recommend that your numerous correspondents should furnish you with correct states of the difference betwixt their county bolls and the Linlithgow. Such, I conceive, would easily be procured from your regular county reporters; and, by publishing these in a connected form, you would be conferring a favour of no small consequence on the agricultural part of the kingdom, distracted as the farmers are by different measures in almost every dozen of miles. I remain, &c.

Nairn, 29th Sept. 1818. W. J. L. M.

*** We beg leave to recommend this sensible letter to the attention of our correspondents, and of our Reporters in particular. Of the utility of such accurate statements there can be no doubt; though we are not sure that they can be so easily procured as this writer imagines. Most farmers are contented with knowing the measures of their own county or district, and are not in the practice of comparing them with the Linlithgow standard. In several counties, two or more boll-measures are in use, not only for different sorts of grain, but for the same, in different quarters of them. It would be desirable to go a little further than is recommended in this letter, and include the weights as well as the measures. We had hoped that, ere this time, a general equalization of weights and measures over the kingdom would have superseded such inquiries as this, to which our attention has often been directed; but this most important object is still perhaps very distant. Some years ago, we attempted to construct such tables as are wanted,—of the inaccuracy of Lord Swinton's we have been long sensible,—by means of the County Reports and other sources of information; but it was not in our power to make them quite correct; and, without an assurance of this, they would only have misled those who might have relied upon their accuracy. It will give us much satisfaction to return to the task with a better prospect of success.——Con.

FOR THE FARMER'S MAGAZINE.

Report presented to his Majesty the Emperor Alexander by his Excellency the Count de Capo-D'Istria, on the Establishments of M. de Fellenberg at Hofwyl, in October 1814.

(Continued from page 313, and concluded.)

The children are taught to love and honour their country, in the history of which they are instructed by reading the work of Stierlin, called 'The Mirror of the Honour of Helvetia, or Select Pieces taken from the History of our Ancestors.' The sentiments which this work produce in their minds are cherished by conversations with their master, and by the national songs which have a relation to its subject.

The more advanced pupils keep a journal of all the more remarkable circumstances which they have observed during the week. This they write down on their slates; and when it has been corrected by Vehrli, it is copied into a small book. The Commissioners have gone over the whole of these books, already voluminous. They usually contain a narrative of the labours of the week, both in the fields and in the house; little agricul-

tural occurrences; remarks on vegetation; fine passages observed in the course of their reading; and notices of the progress of their own education. The Commissioners have found in the greater number of these journals, a remarkable fund of good sense.

It has been asked how their progress can be so great, when so small a portion of their time is devoted to positive instruction. The answer to this may be found in a letter of Vehrli to his parents, which the Commissioners have transcribed into their Report.

'You ask me (says he) how I manage to teach my children, and many others have put the same question to me. My answer is, that I instruct my children at all hours of the day. Without prejudice to the work in which they are engaged, I always mingle with it instructing conversation. In the open fields, surrounded by the beauties of nature, I have better opportunities for fixing the attention and exercising the judgment of my children, than if they were crowded together within the four walls of a school. As the mind of man, especially of children, is never idle, it is proper to employ their thoughts on things that are useful. It is with this view that I endeavour to find out, in the conversations of the evening, which of my children has made the best observations during the day, and learned and retained most. I find this proceeding very useful, because it inspires them with a spirit of emulation. In the morning, I often give them a problem to be resolved during the day:—for example, I say to one,—Find me, before night, twenty substantives beginning with an *a*, the names of things seen in a well regulated house; or so many names of objects which are only to be seen in the open air; or so many adjectives which may be joined to the word "house." These words are afterwards written upon their slates.'

It is also his practice to make them calculate in their head, while working in the fields; and he encourages them to propose to him arithmetical questions of difficult solution.

'All that we engage in with our pupils (says Vehrli in his Journal), ought to afford an occasion for unfolding their dormant faculties. Nothing is employed with them in vain; and there is no object from which they will not learn something, if they are not treated as creatures without understanding, but, on the contrary, their attention directed to useful purposes, and the reasons of things explained to them. Thus, our children are prepared for all the occurrences which may await them in their future lives. For this purpose, what can be more useful than to employ them in such labours as they now perform, and the in-

struction which accompanies them? While engaged in their common occupation, a crowd of objects present themselves on every hand, which afford occasions for acquiring knowledge that cannot be found in the forms of a school; in particular, they could not there seek for the explanations for which, in our method, the boys are so solicitous, and which leads to the most satisfactory results. Here the children put to me a thousand questions respecting the objects that strike them; and instruction is never so effectual as when it is solicited. One asks me, "Why do they make a ditch here?" Another, "Why is the water conducted this way, rather than lower?" A third, "Why this plant grows here, and not elsewhere? Why so large a space is left between the plants? Why the soil is ploughed so deep here, and not so deep yonder?" Or, still further, "Why the days are long, and the nights short, in summer, and the reverse in winter? Whence come the clouds, mists, and vapours? and whither do they go?" If they observe an insect, a bird, or any other animal, they are sure to put a number of questions to me about it; and they are equally inquisitive in regard to the plants, stones, and earths. The faculty of inquiring, discovering, and judging is awakened in them, and exercised in the best possible manner.'

Religious instruction, the care that is taken to render the sentiment of gratitude towards God habitual to the minds of the pupils, completes this course of instruction. Every Sunday the children attend divine service in the house of M. de Fellenberg, along with the pupils of the other institutes: it is the only occasion on which they ever come together. Vehrli is often employed in giving them religious instruction, and never lets slip an opportunity to impress their minds with gratitude towards their Creator. On this important subject he thus expresses himself in his Journal.

'Religious feelings, and the exercises of worship, are the best guides through life: What is man without religion? The duties of piety are the first and the most important to be inculcated upon children. The phenomena of nature, and the changes which are constantly taking place, lead to questions which afford me many occasions for instructing them concerning the existence of God and his perfections, in a manner which never fails to make a deep impression upon them. I explain to them, that we have the happiness to know God in a more especial manner, as He has taught us, in the sacred writings, his designs towards us. I tell them, in short, that he has carried his love to his creatures so far, as to send his only Son into the world to make us acquainted with his will, and to render us good and happy. I seize the moment, when my children are in

the best disposition, to read to them some passages of the New Testament concerning the doctrines and life of Jesus, in which he appears to them the best of models. I read but little at a time; but I add such explanatory details as I am able to furnish.

'Children may be taught to know God, without employing any book of devotion. In a fine summer evening, I went out with my children. In the west there still was seen the ruddy tinge of the departed sun, and, in the opposite quarter, the moon rose in majesty from behind a mountain, and threw its mild beams on the waters of a lake. The children knew not where to look, the sky was so beautiful. But the moon at last attracted their particular attention. Some of them proposed to sing a hymn, beginning with the words, "The star of night rises slowly." We all joined in it; and then I took the opportunity to bring to their recollection, that God had created all these objects. When we returned to the house, I read to them another hymn, which begins with, "There is in heaven a Father who loves us;" which made a deeper impression upon their young hearts, than if I had given them a discourse from a book of devotion. Last autumn we were caught in the fields by a storm of rain, hail, and thunder, at which some of them displayed great terror. Parents often tell their children when it thunders, Go to prayers, for God is angry. To preserve my children from such false notions, I assembled them as soon as we had returned; and, after reading a hymn, made them perceive that God is always good, by explaining to them the advantages we derived from storms, and the nature of thunder and lightning; adding, that the wicked only had cause for fear, but that the good took occasion, from these phenomena, to bless God, and testify their gratitude towards Him.'

It is very satisfactory to observe the spirit of concord which unites them. They love and assist one another, know not what it is to quarrel, and the strong always protect the weak. When any of them happens to be sick, all wish to be of service to him, and evince their anxiety for his recovery. They are upright, temperate, charitable; their morals are in unison with the spirit of that religion which inspires them, the habits which it forms, and the examples which surround them. The inhabitants of Hofwyl, amounting to about five hundred, form a well ordered society; every member of which, animated with the spirit of its chief, labours unceasingly to promote the general welfare. All that meets the eyes of the children, speaks of order, industry, and activity. Objects of benevolence and affection to all who surround them, they feel themselves raised in their own eyes; grateful for the happiness they enjoy, it is their constant ambition to deserve it.

This happiness is expressed in their looks, whether they are at work in the fields, or listening to instruction, or observed at their meals; they are habitually cheerful. They give themselves up to their sports with a noisy mirth, which is nowise restrained by the presence of their master, who makes himself their equal, but into which there never intrudes a single indecent word or action. When, in the midst of this obstreperous merriment, the voice of their master is heard calling out "Let us go, my children, it is enough," the sports instantly cease, silence succeeds, and all follow him without a murmur.

In perusing the Journal of Vehrli, this Christian philosopher of four-and-twenty years of age, we admire the power and correctness with which he has seized the whole system of M. de Fellenberg, and combined and reduced to practice his theory of correction, reward, encouragement, habits, precepts and examples, labour and relaxation, in regenerating twenty-four children already infected with the vices inherent in mendicity, and almost inseparable from great misery. Very rarely has it been necessary to employ corporal punishment. Remonstrances, private or public, exclusion from the common meal, the momentary absence of testimonies of affection and confidence,—such are the simple means, completely justified by success, and skilfully employed by this singular man.

When we have studied the undertaking at Hofwyl as a whole, we perceive that it is not to the excellent Vehrli alone that this complete success is to be ascribed. Vehrli could not have been all that he is, if M. de Fellenberg had not inspired him with enthusiasm for what is virtuous and useful; if he had not supported his resolution by religious motives, by the constant influence of his own presence, by his entire confidence; and, above all, by the example which he set before him of devotion and perseverance in the career of benevolence.

It is to form masters who have some of the qualifications of Vehrli, that the views of those who wish to establish similar schools for the education of cultivators, ought to be directed in the first instance. Difficulties ought not to deter from the enterprise—for the object is of incalculable importance to the welfare of society; and though we may fall much short of the model at Hofwyl, great benefits may still be conferred by such institutions.

After the picture we have exhibited, can it be necessary to recur to an objection noticed before, and which has been often urged against the undertaking at Hofwyl, before the results of this first trial had furnished the answer? It has been said, that it is dangerous to educate the labouring classes; that their know-

ledge may become the elements of discontent; that an educated people are more difficult to govern; and that the government which labours to enlighten the great body of a nation, prepares for itself the means of resistance.

The lessons which thirty years' experience have given to Europe, ought certainly to teach us caution in regard to any change which may affect the political condition of the people. But, would it not be an abuse of reason and of experience, to take alarm at a plan for giving a well-regulated education to cultivators, because we have seen nations become more difficult to govern, and more disposed to political agitation, in proportion as their ideas became more enlarged? Examples taken from people corrupted by the very civilization that has enlightened them, are in no respect applicable to the present case. The inhabitants of great towns, even in the most enlightened countries, are often ignorant of what most nearly concerns their own welfare. Exposed to periods of idleness and distress, they may easily become, in the hands of agitators, the instrument of a political revolution. Here, on the contrary, the only question is about the population of the country—that which constitutes, properly speaking, the mass of a nation. We desire to have it composed of men educated in the school of facts and experience, —employed in those labours which are always productive, and of indispensable utility; men attached to their duties by the ties of religion and habit; men, in short, to whom order and peace are necessary, because all their hopes rest upon both. If there exist a guarantee sufficiently powerful for the maintenance of public tranquillity, it is doubtless to be found in the character of a population composed of such men. Such a people would not become the instrument of the factious, nor the lever by which the ambitious would succeed in shaking the social edifice. They would always oppose to the projects of innovators, the resistance of good sense and reason, and the imposing force of habits of industry and submission to established order.

Results so desirable must have the good wishes of all enlightened and benevolent men. To whom is it a matter of indifference, whether agriculture be vigorous or languishing; whether the mass of a people be virtuous or wicked; whether the spirit of religion, the love of industry, submission to the laws, good morals, respect for property, prevail in the country; whether it is inhabited by faithful, intelligent, industrious workmen and domestics, or by worthless paupers besotted by the abuse of strong liquors, depressed by misery, in a state of secret hostility against the rich, and in the constant practice of preying upon those who seek to relieve their wants? Who does

not perceive, that the reaction of this immorality has a fatal effect on all ranks?—that from the rulers of the state, down to the smallest proprietors, every individual suffers from this corruption, and that all, therefore, must desire to see a remedy applied to it?

Yet it is in the nature of such truths to spread but slowly. To embrace the whole of the subject, requires a certain enlargement of mind; and souls animated with a charitable zeal, are alone deeply moved by the advantages that would ensue from such institutions as that at Hofwyl. The passing tribute of barren admiration is all that M. de Fellenberg obtains from most of the travellers who are led hither by curiosity. Many, no doubt, desire to see this excellent institution imitated in other places; but they are too much struck with the difficulties of the attempt. Some trials have indeed been made in Switzerland on this model; but the powerful impulse which would be the consequence of special encouragement, is still wanting, to extend the benefits of this mode of education. It is to be wished, for the happiness of future generations, that the zeal which actuates the founder of Hofwyl, should warm the breasts of others, and take the same direction. The life of the good is short, as well as that of the wicked. To render the influence of the example of Hofwyl permanent; to extend its salutary effects to other countries, and to futurity, is a design to which God, who holds in his hand the hearts of kings, will perhaps dispose that of a great Prince, whom he has been pleased to place in the first rank of the benefactors of the human race.

To this Report is added a letter from M. de Fellenberg himself, to one of his friends, which explains the views with which he formed the several establishments at Hofwyl; but these have been made evident from what has been already transcribed. It is satisfactory to know, from another paper subjoined to it, that a commission has been appointed for superintending the Institute for the education of the Poor, when M. de Fellenberg shall be no more. The Commissioners seem to be men of influence, animated with the zeal of the excellent Founder; and provision is made for filling up vacancies, with a view to perpetuate their labours.

What we have thus presented to our readers, in this and our three preceding Numbers, is not the scheme of a sanguine recluse, nor of a man who plans an airy fabric on the narrow basis of his own limited experience; it is a thing which has been

done, and which is still a-doing, the work of a private individual with very moderate means—of the MAN OF ROSS of Switzerland, a being more real than he who has been celebrated by our great poet. Yet such is the mingled apathy and incredulity of many who affect to be profound thinkers, that it is fortunate to be able to confirm so singular a statement by the authority of an individual of unquestionable judgment and veracity. Mr BROUGHAM, Chairman of the Committee on the Education of the Lower Orders, made a statement to that Committee, on the 3d of June last, which is substantially the same with the Report of Capo-D'Istria. From this, which may be seen at length in the Third Report of the Committee, we beg leave to make the following extracts.

'I consider that I shall render an acceptable service, and assist the inquiries of this Committee, by giving an account of a very important Institution, connected intimately with the instruction and improvement of the poor, at Hofwyl, near Berne, in Switzerland, under the management of the owner of that estate, Mr Fellenberg, a patrician of that canton.

'Happening to be in Switzerland in the autumn of 1816, I went to Berne, for the purpose of visiting Mr Fellenberg's Institution, which is situated in a pleasant country, about four miles from the town. I was received by him with great courtesy; he showed me, himself, every part of his establishment; and appeared anxious to have the whole details of its management investigated. My intention was to return and pass a few weeks there, for the purpose of acquiring further information respecting the system, and more especially the extraordinary economy which prevails, and which enables Mr F. to effect so much with such slender means. This can only be learnt by a daily examination of minute particulars: to facilitate which Mr F. was kind enough to offer me the use of a chateau in the neighbourhood of his own residence; but the state of the weather for many weeks, and of my own health, made it desirable that I should proceed to Italy, without accomplishing my purpose. I cannot, however, avoid strongly recommending a residence at Hofwyl to any one who may interest himself in these important inquiries; and I can venture to engage for Mr Fellenberg, that he will give such a one, if properly recommended, the same facilities which he so readily offered to me.

'Several tracts have been written upon the subject; the best of which is entitled, "*Rapport fait à S. M. I. L'Empereur Alexandre, sur l'Etablissement de Hofwyl.*" It purports to be the work of the Count of Capo-D'Istria, but was in fact written entirely by Mr C. Pictet of Geneva, who has paid great attention to the plans of Mr Fellenberg, and examined them carefully in different stages of their progress. The work of Mr Rengger deserves also to be consulted; and Mr F. himself has published some tracts in German. All these

publications are to be had at the bookseller Paschoud's, in Geneva and Paris.

'The groundwork of the establishment is a farm of moderate extent, from 210 to 220 posen, answering nearly to our English acres, which Mr F. cultivates himself with great assiduity and success. Upon this he has ingrafted the other branches of his institution, which consist of a seminary for the education and moral and religious improvement of the poor; an academy for the richer classes of society; an agricultural institution for a limited number of pupils; and a manufactory of agricultural implements.'

'The details which will be found in the works I have already referred to, give minute and satisfactory illustrations of the virtuous habits of these labourers, and of the happy and contented lives which they lead. I trust that one or two of them, such as the "*Rapport*," will be translated into English. That the complete education which it is Mr Fellenberg's principle to give the children, interferes in no degree with the business of their lives, but rather forwards it; and that the farm cultivated by them succeeds perfectly, the inspection of his accounts (which he lays open to every visitor as a matter of course) clearly demonstrates. The profits of the farm, consisting of 214½ posen, (nearly equal to our acre), for the four years ending 1814, were annually 14,176 Swiss livres, or about 886*l.* Sterling; being above 4*l.* an acre, including the interest on the original purchase-money of the land. The cattle concern is entirely kept out of this account; which therefore exhibits more clearly the success of the cultivation depending upon labour. It is to be observed, that Mr Fellenberg has had to contend with powerful prejudices on the part of his countrymen, and has certainly received neither encouragement nor countenance from the government of the Canton. On the contrary, the belief very universally prevails, that he is regarded by them with an unfavourable eye, and that strangers are not much encouraged to visit Hofwyl. The first impression, propagated with some industry, was, that his visionary schemes would be his ruin. When the undertaking seemed to prosper, the attack was changed, and he is now upbraided with amassing a large fortune; an accusation equally unfounded, as the account which I have given of his great liberality and charity may serve to show. The patrician order (to which he belongs) also took umbrage at his devoting himself to what was termed "a schoolmaster's life." (*vie pædagogique.*) But I trust that these prejudices are now wearing away; and certainly he is, in this respect, largely indebted to the enlightened assistance of M. de Bonstetten, M. Pictet, and the other men of letters at Geneva, who have always zealously favoured his undertaking.

'That the habits of common labour are perfectly reconcileable with those of a contemplative and even scientific life; and that a keen relish for the pleasures of speculation, may be united with the most

ordinary pursuits of the poor, seems to be proved by this experiment of Mr Fellenberg. I am quite aware that he has only made it upon a small scale; that its application to a populous district may be difficult; and that a substitution of manufacturing for agricultural labour would greatly augment the difficulty. Nevertheless, before we say that little can be effected in this way, we ought to consider how limited have been Mr Fellenberg's means. The farm on which he has done so much is under 220 acres; and his income, independent of the profit he derives from the breeding of horses, in which he is very skilful, and his manufactory of husbandry implements, does not exceed five hundred a year. The extraordinary economy which reigns in his establishment, is indeed requisite to explain the existence of such an institution; for although the Academy and Institute are supported by the richer pupils, these pay a very moderate sum: and the family, who are lodged and wholly supported at Hofwyl, amounts to 180 persons. These dine at six different tables; and their food, though simple, is extremely good.'

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Strictures on the Management of the West of England.

SIR, *Clifton, 20th October,* 1818.

BEING an old subscriber and friend to your work, I take the liberty of sending you a Bristol paper, containing an account of a ploughing match which took place on the 6th instant.

The principal prize, you will see, was awarded to Mr William Cullimore, tenant to Dr Newman at Thornbury Park, Gloucestershire; and the next to Mr J. M. Buckland, tenant to P. J. Miles, Esq. of Leigh Court, Somersetshire. Your countrymen, who have carried the palm at most of these matches, managed several of the ploughs; and, when the business was finished, two or three of them accosted Screen, Mr Cullimore's ploughman, and asked him 'what part of Scotland he came from?' to which he replied, 'I *be* a Gloucestershire lad, born and bred in the parish of Thornbury.'—This was what they did not expect, as they had not been vanquished before. But I must observe that Gloucestershire, at least that part of it, is indebted to Scotsmen settling in the neighbourhood, for all the improvements in corn farming practised among us.

I will give you some of the characteristic marks of the grazing and cheese districts:—Hedges, very often from three to five yards wide, full of brambles, underwood, &c., by which an im-

mense quantity of ground is lost; trimming a hedge is quite obsolete:—Large quantities of pollard trees, *i. e.* trees that have had their heads indiscriminately lopp'd off when they were young, fuel being scarce;—the farmers here generally burn a wooden fire, at the expense of their landlords. As to manure, it is a thing they deal very little in, but crop their lands for seven years together without spreading a single load. Thus, many rich soils are beggared; and then, they wonder how the ground does not produce what it used to do. They also mow the same grass lands for 20, 30, and 40 years successively.

The common *team* in ploughing here is generally four stout horses *tandem*, or five oxen; the latter is certainly a *classical* one; for Horace says,—

Beatus ille qui procul negotiis
Ut prisca gens *mortalium*
Paterna rura Bobus *exercet* suis.

But as to a farmer here reading Latin, you might as soon expect to see him fly. I asked a respectable one, who rents 1000*l.* per annum, if he had ever read the account of the farming in Norfolk at Mr Coke's, or of that in the Lothians, he answered, that 'he could not abide reading;' therefore, any thing *he* learnt was from ocular demonstration. Hence the good that arises from such societies as the Bath and West-of-England Agricultural Society, which bring their *practice* before the eyes of the *bigots* of this district, who will not believe unless they see.

An old farmer in this neighbourhood was one day told, that a machine had been invented which would thrash as much corn in a day as his two men could do in a month; and he said, 'that might be; but his father had paid all his rent for 50 years before *him*, and he had paid it 40, but that neither of them had ever used, or ever would use, such a machine.'

I was in the Lothians last summer, and pleased greatly with the agriculture there. The contrast, on returning to this district, may be easily conceived. You will scarcely credit it when I tell you, that there is barley uncut between this and Gloucester!! As this part of the country was much burnt up in summer, there is more grass now, in consequence of the moisture and heat, than there was all the summer months. Cheese has got to an enormous price, from 80s. to 95s. per cwt.: higher than it was during the war.

The wheat sowing is nearly finished, and, on the high grounds, it has been up some time; but does not look well in general.

If I have not trespassed too much on your patience in this

letter, I shall perhaps give you a few lines in the spring. In the mean time, allow me to subscribe myself,

Your very humble servant,

VERITAS.

*** We shall be glad to hear again from this correspondent.—CON.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

Answer to Pol-Œconomicus Redivivus, on the Question, 'Whether Exportation of Land Produce impoverishes the Soil on which it is grown?'

> He could distinguish and divide
> A hair, 'twixt south and south-west side;
> On either which he would dispute,
> Confute, change hands, and still confute.—HUD. Canto I.

SIR,

WITH the real *Pol-Œconomicus* I was acquainted from his boyish years; and I most sincerely lamented his premature death, not only on account of the high admiration I entertained for his distinguished talents, and manly virtues, but because I considered this deplorable event to be a public loss to his country and to mankind. With regard to this ghost which affects to be his, it appears in such a questionable shape, that I must speak to it; and I would observe of it as Æneas did of the ghost of Hector, ——— *Quantum mutatus ab illo Hectore, qui redit exuvias indutus Achilli!*

> How chang'd from him, returned from glorious toils
> Triumphant! clad in great Achilles' spoils!

But although he may shake his gory locks at me, I trust that I shall be more alarmed than hurt. For

> ——— His bones are marrowless!
> There is no speculation in those eyes
> Which he does glare withal!

Meantime, instead of a ghost, I rather suspect we have got some young lawyer, who is ambitious of displaying his dexterity in managing an argument, and who contends, not for truth, but for victory. If this supposition be well founded, I own myself beaten, and quit the field; for you must know there are three classes of mankind, for many of whom I entertain a very high esteem in their private individual capacity, but have no great inclination to jostle or encounter any of them in their public or official capacity. These are, Doctors, Lawyers, and Hangmen. As to your lawyers, they think no more of a par-

cel of poor ministers and farmers, than the renowned Don Quixote did of mowing down a whole regiment of giants by a backwipe of his sword. Without, therefore, presuming to enter into any contest, or argument, with this very learned gentleman, or ghost, or whatever else he may be, I hope it may give him no offence to be set right in a few points of fact. I find, that, in some particulars, he has misunderstood my meaning; and I am ready to impute this, rather to my inaccurate way of expressing myself, than to his dulness of apprehension.

With regard to my consistency in talking of a sovereign people under the despotism of an emperor, he may please observe, that the state of society which induced the sovereign people of Rome to abandon agriculture, and to depend chiefly upon imported corn, had existed long before despotic emperors were thought of. The final establishment of a despotism, in the person of Augustus, made no change in the internal structure, or the external condition, of society. The sovereign people still continued to choose their consuls, and other annual magistrates, and to vote in the enactment of laws; under leading-strings, it is true, as they always had been. The only difference was, that their leading-strings were now more apparent than formerly; and, to keep them quiet, they were gratified with more ample largesses of corn. In process of time, the prætorian bands became the sovereign people, with arms in their hands to enforce their decrees; and when any whim of theirs was slighted, down went the despotic emperor, and up went another, who promised to be more complaisant to their sovereign majesties. They even sometimes went the length of disposing of the imperial purple to the highest bidder, by public auction. When a great proportion of the free Roman citizens began to prefer living upon the revenues extorted from the provinces which had been subdued by their arms, to living, as their ancestors had done, upon the fruits of their industry exerted upon their land, such things must have happened, whatever might have been the form of their government. It may be observed, that the corn which Rome received from Sicily, from Africa, and from Egypt, was furnished in the shape of tribute; and the question is, Whether its exportation empoverished the countries which produced it, and if it enriched the country where it was consumed?—I am very far from being positive that Sir Humphry Davy is wrong in his opinions on this subject: All I insist upon is, that neither the affirmative nor negative should be received, without a full and deliberate investigation of facts.

Your correspondent A. H. (No. LXXV. p. 298.) adduces facts, which are immediately under your observation, and which

I need not therefore repeat, that seem strongly to militate against Sir Humphry Davy's doctrine. But your ghost, or whoever he may be, blinks the facts condescended upon in my paper, and runs away across the Atlantic, and here and there, in quest of other facts which he thinks more suitable to his purpose. He says, 'These very lands, however, (meaning those of Italy), 'being under herbage, or pleasure grounds, would accumulate 'a mass of matter which could afterwards be extracted in the 'production of grain, fruits, and every other vegetable the 'most useful and valuable to mankind;' and this he thinks a strong confirmation of Sir Humphry Davy's statement. Now, the fact I mean to state is, that these immense importations never actually did enrich Italy, nor accumulate any magazine of vegetable food in it, especially in the lands around Rome, where the greatest part of them were consumed. Travellers have assured me, that the lands around Rome are a steril sort of clay, of a whitish colour, wholly unfit for producing grain or fruits of any value, and hardly yielding a stunted herbage to a few starving sheep, goats, and cattle. They certainly were very productive, when manured and cultivated by the antient Romans; but, during many ages, they have been allowed to relapse into total sterility. I think myself entitled to charge this effect to the former immense importations, having induced the Romans to abandon the manuring and cultivation of their own lands, especially those nearest the city; and hence, this fact, instead of supporting, seems to militate against Sir Humphry Davy's doctrine.

I have also been told, that the lands around Constantinople, although under the finest climate in the world, are extremely steril and unproductive; because, in fact, there is very little cultivation exerted upon them. There, the Janizaries have long been the sovereign people, like the prætorian bands in times of the Roman emperors. When they are displeased at the sultan, or his ministers, they have a way of giving them a gentle hint, by setting fire to the city in various places at once. If what they want be not complied with, they next proceed to a still broader hint, by rushing in to the seraglio, and striking off their heads. To keep these capricious sovereigns in good humour, the sultan finds it necessary to import great quantities of corn and other produce from the Euxine, the Grecian Islands, Egypt, &c.; and either to distribute them for nothing, or to sell them at much lower prices than they fetch in all other parts of the empire. But these importations do not enrich the lands where they are consumed, because, cooperating with the tyranny or rather anarchy which prevails, they throw insuperable

obstacles in the way of cultivation. From all we can learn, the country around Constantinople was well cultivated, and highly productive, before these sovereign Janizaries had any thing to do with it. The lands around Madrid are represented to be very steril and ill cultivated; and yet the Spanish government have long been in the practice of supplying the inhabitants of that city with corn, and other produce, at a much lower price than is obtained in other parts of that kingdom. We need not go further than the city of London, which is the great emporium of the land and mineral produce of the world. Excepting grass and garden grounds, to supply the inhabitants with milk, fruits, roots, and other vegetables, the lands around London are very steril, because they are imperfectly cultivated. Extensive heaths prevail, which yield only a miserable sort of coarse grass and heath (*erica vulgaris*), in a very dwarfish state. It is true, manures are carried to great distances from London, both by land and water; but a great proportion of them are washed into the Thames; and the inhabitants seem to have other objects in view than to cultivate the lands contiguous to them, except for articles which cannot be brought from a distance. What I meant chiefly to state was, that very little of the putrescent manures of London, reached the lands which chiefly supply that city with corn and animal food; and yet we do not find the productiveness of the supplying lands sensibly diminished, nor that of the lands near the city sensibly increased, in these articles.

It is well known, that light sandy lands, such as this gentleman describes in Norfolk, soon lose their fertility by severe cropping, although Providence has generally placed below, or contiguous to such lands, a rich bed of clay, which is the best corrective of this defect. But the gentleman has not stated, whether the deterioration he speaks of, be owing to a diminution of the usual quantity of putrescent manure, in consequence of exporting their produce. I suspect the same thing would have happened, although the whole produce of such lands had been consumed on the spot, and the whole refuse had been returned to them in the shape of manure. With regard to the free application of calcareous manures, only increasing the fertility of land *for a certain time*, but afterwards reducing it, I knew cases in the southern districts of this country, when lime first began to be used, where farmers applied excessive doses of this manure, and afterwards took more than twenty crops of oats without change, until the land no longer returned the seed. This raised so much alarm among landlords, that some of them prohibited the use of lime under severe penalties. Something similar to this happened in this county of Angus, when shell

marl first began to be applied. In these cases, I do not ascribe the mischief to the application of calcareous manures, but to the severe and very injudicious cropping that ensued. Such cropping would have ruined the land, where no calcareous manure had been applied; although a sufficient quantity of putrescent manure would have retarded, though not prevented, the evil. Accordingly, ever since the alternate husbandry was introduced into this county, the lands have been in a progressive state of melioration, notwithstanding the occasional application of lime and shell-marl. It is not meant that their fertility will increase *ad infinitum*; for there is a certain point, beyond which it would not be desirable that this should be carried, since plants, as well as animals, may be as effectually injured by a surfeit as by starvation. But lands which have been injured by excessive cropping after lime, like sandy soils, are likely to be restored by rich clays, especially if they be marly or calcareous; and such clays occur in various parts of this county.

With regard to the decay of the heaths upon our Highland mountains proving unfavourable to sheep, it may be observed, that there are substitutes at hand much more beneficial; and, were they generally introduced, it would be desirable that the heaths were wholly extirpated. I knew a gentleman in Orkney who inserted the seeds of whins, or furze, along the sides of a heathy hill, exposed to the sea-spray, as a preparation for laying his hills under sheep. The whins grew with amazing luxuriance; and there can be no doubt but they would prove a better resource for sheep, summer and winter, than all the heath in Orkney. I have no doubt but the seeds of broom would grow in dry places, along the sides of our Highland mountains, in the same manner. They would only have to keep the sheep from these shrubs until they were sufficiently rooted; after which, they would furnish both salutary food and shelter. I am surprised our Highland Society have never turned their thoughts to this substitute for heath. In the south of Scotland, where the heath upon the sheep walks is nearly extirpated, great exertions have been made, as suggested by me, to provide hay by irrigation and otherwise, and also turnips, as a substitute; and these improvements have also made some partial progress in various parts of the Highlands. But the sheep farmers in the South, as well as those in the Highlands, would do well to raise whins and broom, as an additional security against hard winters.

The late Mr James Stein of Kilbagie leased extensive tracts of waste land, in order to apply the manure produced at his distillery, by feeding cattle and hogs upon the draff and dreg. Previous to this, a most zealous and active spirit of agricultural

exertion had begun to animate the gentlemen and farmers of Clackmannanshire, which soon rendered them models for the whole kingdom. It was here that premiums for ploughing matches, and other improvements, were first instituted. But great part of the barley consumed at Kilbagie and Kennetpans, was the produce of the neighbouring counties, with occasional supplies from England, when that proved deficient. No doubt, the refuse of these distilleries helped on the improvement of that county. But they would have had no sensible effect, without the zeal which animated all ranks of the people. As much of the effect may be ascribed to the stimulus of a ready market for barley in the neighbourhood, as to the manure accumulated at these distilleries; for, as far as my local knowledge extended, none of that manure went beyond the farms in the natural occupancy of the distillers themselves.

Before following your correspondent across the Atlantic, it may be proper to premise, that any kind of land will be injured by a constant repetition of the same crop, however it may be manured, or whether the produce be consumed upon the spot, or exported. In illustration of this, I have only to direct your attention to what are called the *mail gardens* about Edinburgh and other great towns, which have been, from a very distant period, occupied by green-kail, or other pot-herbs. Although these gardens every year receive great doses of the richest dung, yet the plants they produce are dwarfish, tough, and bitter to the taste. The most steril corn land, with one good dunging would carry a very luxuriant crop of the same plants, and of the most delicate flavour. Were these small mail gardens, without any additional manure, to be made to carry a few crops of wheat, or other grain, their capacity for pot-herbs would be much improved.

I conceive the island of Barbadoes, which this gentleman states to have been very fertile when first reduced into a sugar colony, but to be now comparatively very steril, notwithstanding the most correct cultivation and careful application of manures, to be precisely in the same situation with some of your mail gardens near Edinburgh. Your correspondent ascribes all this sterility to the exportation of sugar; while he admits that the inhabitants import by far the greatest part of their provisions, and are supplied with fish from the neighbouring ocean. Thus it appears, that their imports far exceed, in bulk at least, their exports; while they are most attentive in collecting and applying manures of every species, and even bring rich earth for this purpose from the Spanish Main, a distance of some hundred miles. From all these circumstances, I would more naturally

expect Barbadoes to be brought down upon me, as an example of increased fertility from importation, than of sterility from the exportation of its produce. But, I humbly conceive, the effect under consideration has not the most distant connexion, either with importation or exportation. This island appears to have been constantly under sugar canes ever since they were planted in it, without either rest, or change of crop; so that the soil has at last begun to tire of producing them, and cannot be further stimulated by any manures whatever. Applying fresh earth may do the business, because this is, in effect, taking a a new soil on which to operate. Now that the slave trade is abolished, it behoves our West India planters seriously to consider, whether it may not consist with their real interest, as well as promote the comfort and multiplication of their negroes, were they to introduce such rotations as have proved so beneficial in other countries, by changing their sugar grounds into provision grounds, and *vice versa*. By such a rotation, they may not have so great an extent under the sugar cane, but more produce, and of better quality, from the same extent. They should manage their cultivation so as to feed their people and animals, in the first instance, without depending much upon imported provisions, excepting a few articles which are there reckoned luxuries, and raise sugar only from the lands that are not thus occupied, making these different products to go round the whole plantation by regular rotation. In this way I conceive the fertility of these islands may be not only preserved, but even increased. But if they continue sugar canes upon the same land for too great a length of time, I suspect that, whatever manures they may apply, the produce will at last be so much diminished as not to defray the expense of cultivation. I do not mean to say, that manures will not protract this event, but the contrary; although their effect will constantly diminish.

It appears to me, that some of the earliest cultivated lands in America are now in the same situation with most of the old sugar lands in Barbadoes. In that country, good oak land, or that which carried the largest oaks, after the trees were felled, produced from 25 to 30 bushels of wheat, or more, per acre, without any application of manure. The first settlers, having an unlimited extent of land to revel in, took from 20 to 30 crops of the same kind in succession, until the produce no longer repaid seed and labour, when they abandoned the old, and proceeded to clear new land. In Virginia and Maryland tobacco was chiefly cultivated, which is a very exhausting crop; and this was repeated on the same land until the produce no longer repaid the expense. This led the Abbé Raynal, who saw the

effect, but did not understand the cause, to pronounce the productive powers of the Western world to be in a rapid state of decay, and that they would soon be entirely annihilated. A near relation of mine went over, and was appointed overseer, or manager of General Washington's very extensive estates at Mount Vernon, when this gentleman was President of the United States. As this great and good man was reckoned the standard of America, for agriculture as well as politics, we were naturally led to expect something very superior in his system of husbandry. Yet, from the correspondence of my friend, it appeared to be wretched in the extreme. This happened so long ago, that the particulars are now very faint on my memory, so that I do not pretend to accuracy in what I state concerning them. But I think there were about 500 working negroes on the estate, of whom seldom above a half, or a third, could be mustered at a time. A great proportion of the land was constantly under Indian corn for the subsistence of the negroes, without ever changing the crop; and hence was reduced to great sterility. Hence I inferred, that the labour of slaves is the most costly, as well as the most inefficient of any. Another part of the estate was always in wheat, for sale; and the returns, as might be expected, were very insignificant, and such as, in this country, we would not reckon worth seed and labour. My friend sent for ploughs, harrows, thrashing mills, and all other implements of husbandry from this country, with people who understood the use of them, and was trying to introduce our alternate system of husbandry; with what success I have not learned.

From these facts, I think we are warranted to conclude, that the comparative unproductiveness of Barbadoes and of America, where it actually exists, has not been occasioned by the exportation of their produce, but by the too frequent repetition of the same crop upon the same land, whether with or without a sufficient application of manure;—that the application of manures may have retarded the progress of this unproductiveness; but has not been found ultimately to prevent it, without a sufficient change in the species of crops.

With regard to the question respecting the use of water as a manure to plants, I suspect your correspondent and I would not differ materially, could we only contrive to understand each other. I hold water and atmospheric air to be the sole and only vehicles by which nourishment is conveyed to plants. But I go further, and hold, that each of these fluids not only acts as a vehicle to other substances, but actually furnishes certain ingredients which enter into the composition of plants. I con-

ceive that all manures, water not excepted, operate in two ways. 1*st*, In improving the texture and consistency of the soil. In this way I conceive the fine mud operates, which your correspondent describes as conveyed into Bengal and Lower Egypt, by the Ganges and the Nile. But I hold, that even pure distilled water, if in sufficient quantity, would have some effect this way, although not so great as that which is loaded with mud. 2*dly*, In furnishing substances which enter directly into the composition of plants. Along with mud, your correspondent speaks of putrid animal and vegetable substances as conveyed by the waters of the Ganges and the Nile. All running waters also contain a portion of carbonic acid, and other gases of which carbon is the basis, which are known to afford direct nourishment to plants, whether absorbed by their roots or leaves. Now, the question is, how these materials come to be appropriated by and fixed in plants, so as to become part of their solid substance. My ingenious friend, Mr Naysmith of Hamilton, in his Essay on the Vegetable Economy, and many other writers, seem to think, that carbon, and all the other ingredients which enter into the composition of plants, are conveyed into them, and absorbed by their roots, in consequence of simple solution in water. Sir Humphry Davy, from whom I expected much information, seems to speak doubtfully on the subject. —My own opinion is, that these very wonderful phenomena are the result of various chemical processes which take place, first in the soil, and afterwards in the plant. But as this answer has already swelled beyond all reasonable bounds, I must reserve my opinions upon this very mysterious point to a future opportunity. Meanwhile, with best wishes for the success of your very useful work, I remain, &c.

Dunichen, Forfar,
15th Oct. 1818. JAMES HEADRICK.

FOR THE FARMER'S MAGAZINE.

Account of the Report made to Parliament by the General Assembly of the Church of Scotland, respecting the Management of the Poor.

[From the Edinburgh Magazine, published by Messrs Constable & Co., September 1818; being a continuation of the article in our August Number, p. 332.]

IN our Number for June, some account has been given, from the Report of the General Assembly, of the management of the poor in Scotland; from which it appears, that, though the expenditure has increased in many parishes, yet that the amount, when compared with that of the poor-rates of England, is still

very moderate. It is gratifying, at the same time, to know, that the wants of the really impotent poor are, in most parts of Scotland, supplied by voluntary contributions, and not by legal assessments, though it cannot perhaps be denied, that the fear of assessments may often come in aid of the feelings of humanity. The Report, as was then observed, contains information on several points intimately connected with the subject of pauperism, of which we now propose to notice the general results, —not without the hope of being able hereafter, when the Report itself shall be published, of entering more fully into this highly important branch of our domestic economy.

From the returns lately made to Parliament, * it appears, that the number of persons relieved from the poor-rates in England and Wales, is $9\frac{1}{4}$ in every 100 of the population; whereas the General Assembly's Report states the number relieved in Scotland to be only at the rate of $2\frac{1}{2}$ in the 100.† The difference between the two systems or their administration, and the character and condition of the lower classes in each country, are displayed, by this single fact, in a more striking point of view, perhaps, than by a comparison of the sums applied to their relief, or by minute details of management. It would also appear, from the articles already referred to, that the sums applied to the relief of the poor in Scotland bear a much lower proportion to the amount of the English poor-rates, than in the ratio of the numbers of the paupers. While we have fewer paupers in our population than in England, in the proportion of $2\frac{1}{2}$ to $9\frac{1}{4}$, the amount of the relief required, if it were the same in both countries, for the same number of individuals, would be, in every 100 of our population, more than one-fourth of what is paid in every 100 of the population of England. As the population of England is, to that of Scotland, nearly as $5\frac{3}{7}$ds to 1, the total amount of the poor-rates of the respective countries should be as $5\frac{3}{7}$ multiplied by 4 minus a fraction (the proportion between $9\frac{1}{4}$ and $2\frac{1}{2}$), or as 22 is to 1; whereas the fact seems to be, that the sum raised in England is to that raised in Scotland as 48 is to 1.‡ The sum paid to every pauper in England is, therefore, more than twice the sum paid to a pauper in Scotland. That this remarkable difference does not arise from the general poverty of Scotland, is evident from this consideration, that the assessable property of England, which pays forty-eight times the sum that is paid in Scotland, is, ac-

* Edinburgh Magazine for July, p. 50.
† Edinburgh Magazine, Vol. II. p. 506.
‡ Edinburgh Magazine for July, p. 48.

cording to the latest returns made under the Property-tax act, not quite nine times the amount of the assessable property of Scotland. The conclusion to be drawn from these two facts,—the smaller proportion of paupers to population, and the smaller sum given to each of these paupers, in Scotland than in England,—seems to be not only that a spirit of independence prevails more generally among the labouring classes of Scotland, but that even the real distress which *must* be relieved, does not altogether extinguish this feeling, which still urges the pauper to make his own feeble exertions contribute more or less to his maintenance. There is no such thing to be seen in Scotland as a person in the vigour of health and strength living in idleness on the poor-funds, and hardly one, however old and infirm, if able to do any sort of work, that does not contribute more than the public, to his own support.

This becoming pride prevails in the manufacturing districts of Scotland as well as in the merely agricultural—where the population is accumulated in towns, as well as where it is thinly scattered over our wastes and mountains. In the former it is probably the effect of education, which resists the contagion of example; in the latter, of that natural sentiment which, among a people of simple manners, and where helpless poverty is a rare occurrence, associates degradation with dependence upon charity. In both, it is preserved by habits of rigid economy. It is true, that mendicity still prevails in many parts of the country, but less among the native poor than among strangers; and where the former, owing, perhaps, to the unequal provision made for the poor in different parishes, rather than to the slender amount of the whole, have recourse to begging, the practice seldom assumes that offensive form which is so observable in other quarters. With the deserving poor of our country parishes, it is a modest claim to hospitality, not unfrequently repaid by petty services, and always with sincere gratitude, rather than the teasing, obtrusive, and sometimes petulant demands of vice or idleness.

Education, Friendly Societies, and Saving Banks, are the subjects in the Report of the General Assembly to which it will now be proper to attend.

Education.—For this important object there is a school established by law in every parish in Scotland, at all of which English and arithmetic are taught, and at many of them the Classics, French, and the lower branches of mathematics. The salary, paid equally by the heritors (landed proprietors) and tenants in country parishes, has been fixed by a late act, 43. Geo. III. c. 54.; 300 merks, or 16*l.* 13s. 4d. being the mini-

mum, and the maximum 400 merks, or 22*l.* 4s. 5½d., besides a house and garden. In addition to this salary, the master receives a moderate fee from his scholars, varying in different places, and according to the branches taught, from 1s. 6d. to 5s. a quarter. The children of the poor are educated at these schools gratis. But notwithstanding this excellent institution, to which Scotland is eminently indebted for the knowledge and morality of her lower classes, the present Report has disclosed the lamentable fact, that a large proportion of the people of the Highlands have not access to the most necessary instruction. In Highland parishes, some of which are 10, 20, 30 miles and upwards in extent, one school is altogether inadequate, and the poverty of the people disables them from establishing others at their own expense. In the synods of Moray and Ross, many parishes have several hundreds that cannot read. Only one in twelve has been taught in one parish, that of Contin in Rossshire. From Sutherland and Caithness also similar complaints are general. In the parish of Tongue, 1200 out of 2400 are unable to read. No less lamentable are the returns from Argyleshire, and particularly from the synod of Glenelg, where in one parish 2500 are destitute of this primary and fundamental acquirement. In the island of Uist, one of the Hebrides, there is a parish in which not 500 out of 3000 or 4000 can read. In others, half the population or more are in the same condition. The Gaelic shools have done much good in this respect; but still much remains to be done. The want of schools in the Highlands is the more to be regretted, since there prevails the most anxious wish for education; and nothing prevents it from becoming general, but the impossibility of obtaining it.

In these districts the means of religious instruction are also deficient from the same cause. The extent of the parishes, and the natural obstacles presented by rivers, mountains, arms of the sea, &c. require often a long and even dangerous journey to attend church, and render frequent intercourse between the minister and his parishioners impracticable. After all that has been done by the Royal Bounty and the Society for Propagating Christian Knowledge, the wants of the people are still great. An earnest wish for religious instruction also prevails very generally. A great many Bibles have been sent thither by Societies in Edinburgh; but while a large proportion of the people cannot even read, the happy effects of this pious donation must be comparatively limited.

According to the returns made to the General Assembly, there are in Scotland 500 *Sunday schools*, attended by about 25,000 scholars. In Edinburgh, the number of schools is 83,

at which 5900 are taught, and in Glasgow 34 schools furnish instruction to 3500. In some parishes such schools have been judged unnecessary, for a most gratifying reason,—the attention bestowed by the parents themselves on the education and religious instruction of their children. Every house there, it is said, is a Sunday's school, and the parent the teacher.

The *mortifications* (as deeds of mortmain are called in Scotland) for the purposes of education, amount to 30,700*l.* of capital, and 2020*l.* of interest. To this must be added, the large sum of 70,000*l.* which has been lately bequeathed to the parish of Dollar, in Clackmannanshire, by an individual of the name of Macnab. * It deserves notice, that, exclusive of this bequest, the sum *mortified* for the purposes of education is larger than that *mortified* for the support of the poor, which is only 10,000*l.* of capital, and 2000*l.* of interest; a circumstance which proves the value which the Scots set upon education. Of these *mortifications*, many are only from 1*l.* to 5*l.* Some are for schools, others for paying the fees of poor scholars. They are all applied, it is believed, with the strictest fidelity.

Friendly Societies.—Of these establishments, the number reported is 327, comprising 72,000 members. Of their advantages, when formed upon a well-conceived plan, and conducted with fidelity and integrity, there can be no doubt; yet it would appear that they are very liable to abuse. Many cases of mismanagement and loss have occurred, which might have been prevented, if a few individuals of greater knowledge and influence than the contributors themselves had assisted in the direction of them. It deserves to be remarked, that, if all the societies have been reported, the number of members appears to be only four in the hundred; whereas, in England, the members of such societies are more than double this, or eight and a half

* It is remarkable, that the history of this person, and his connexion with the parish of Dollar, should be very imperfectly known. The money is left at the sole disposal of the minister and kirk-session of Dollar, a parish containing only about 800 souls. The present minister is the Reverend Andrew Mylne, a gentleman long eminent as a teacher in this city, and the author of several valuable works on education. It is proposed, we understand, to employ the money in forming an academy, which will be the most extensive in Scotland, and perhaps in Britain. Besides teachers for English, Latin, Greek, and the modern languages, there will be professors of botany, practical chemistry, mathematics, natural history, moral philosophy, and some other branches. The details of the plan are not yet sufficiently matured for the public eye.

in the hundred. The greater proportion must, at any rate, be on the side of England,—which is a pretty strong proof that habits of dissipation, and indifference to the future, do not prevail so generally among the labouring classes of that country, as has been often alleged.

Saving Banks.—These promising institutions, though of very recent introduction, already amount to 130, exclusive of those of Edinburgh and Glasgow. The depositors in these may be reckoned at 7000, and the sum deposited at 30,000*l.* The number of the banks, and the amount of the deposites, would probably have been much greater, but for the late distressed state of the country. In some places, where there is no bank, ministers or heritors have been in the habit of receiving the deposites of the poor.

A bill for regulating these banks was introduced into last Session of Parliament, but did not pass; and there seems to be an aversion on the part of the depositors generally, as well as of the managers, to any legislative interference at present. The avowed object of the framers of the bill was to provide against what might happen, not to remedy inconveniences that had been actually felt; nor was it alleged that any danger was to be apprehended from the want of a special enactment. The same reasons for such a statute did not exist here as in England, where mercantile banking houses are not in the practice of allowing interest on the sums lodged with them. All the Scots banks pay interest; and for the money deposited by the managers of saving banks, they have sometimes paid a rate of interest higher than is usually allowed. In some instances, these managers are chosen by the collective body of depositors; but in the Edinburgh, and other saving banks, they consist of gentlemen who first promoted the scheme, and have since taken the charge of all its details. In country parishes, the minister and schoolmaster, in most cases, discharge all the duties required, which, with attention to method and accuracy, soon become easy, and require no great sacrifice of time from either.

There are few subjects of equal importance with those that are embraced in this Report; and certainly no class of men are better qualified, by information, judgment, and liberality, for treating them, than the Clergy of Scotland.

*** The Report of the Committee of the General Assembly has now been printed; and the Committee of the House of Commons on the Poor Laws, speak of it, in their Third Report, in terms of high approbation. Yet we are sorry to observe, that the figures given in some of the Tables of the General Assembly's Report, are by no means accurate.—Con.

FOR THE FARMER'S MAGAZINE.

Highways of England and Wales.

[From the Abstract of the Returns relative to the Expense and Maintenance of the Highways in England and Wales, made pursuant to act 55. Geo. III. cap. 57., the County Totals have been extracted and printed by order of the House of Commons, 3d June 1818. To this document the following Observations are subjoined.]

1.—The summary of *England* and *Wales* is collected from 16,955 returns from the surveyors of the highways of 9822 parishes, 5217 townships, and 1916 hamlets, or other places; leaving a deficiency of 120 returns, supposed to be still wanting.

2.—The average length of the paved streets and turnpikes appears to be - - -	19,755	Miles.
3.—The average length of other public highways	95,104	
Total average -	114,859	Miles.

4.—The average value of labour in kind (in the years ending October 1812, 1813, and 1814) appears to be - - -	L.535,423	
5.—The average amount of composition money	278,506	
6.—The average amount of rates levied -	601,954	
Total average -	L.1,415,883	

7.—The aggregate of the value of labour and expenditure of money, appears to be 1,404,842*l.* per annum, being 11,041*l.* less than the value of labour performed and money received; and being also at the rate of about 9½d. per pole, or 12*l.* 6s. 8d. per mile, expended upon the aforesaid highways.

8.—The average amount of money expended in law, appears to be 24,483*l.*, or about 4½d. in the pound of the total expenditure.

9.—The area of *England* and *Wales* appears to be 57,960 statute miles, containing 37,094,400 acres; and the sum assessed to the property-tax (for real property under schedule A.), in 1815, was 51,898,423*l.*; consequently, the sum of 1,404,842*l.* being the estimated expenditure in labour and money upon the highways, is at the rate of 6½d. in the pound, upon the total amount of the property assessed.

FOR THE FARMER'S MAGAZINE.

On the Management of Farm-yard Manure in Norfolk.

[From a Treatise on Manure and other rural Subjects. By FRANCIS BLAIKIE, Steward and Agent to Tho. W. Coke, Esq.]

My observation and experience justify me in stating, that the husbanding of farm-yard manure is (generally speaking) either imperfectly understood, or not sufficiently attended to, in the county of Norfolk.

The principal error in the common method of manufacturing farm-yard dung in Norfolk, originates in the prevailing custom of keeping the dung arising from different descriptions of animals in separate heaps or departments, and applying the same to the land without intermixture, and in an improper state.

It is customary to keep the fattening neat-cattle in yards by themselves; and the manure arising from them is of good quality, because the excrement of such cattle is richer than that of lean ones. Fattening cattle are fed with oil-cake, corn, Swedish turnips, or some other rich food; and the refuse and waste of such food thrown about the yard, increases the value of the manure: it also attracts the pigs to the yard. Those industrious and useful animals rout the straw and dung about in search of grains of corn, bits of Swedish turnips, and other food, by which means the manure in the yard becomes more intimately mixed, and is proportionally increased in value. The feeding troughs and cribs in the yard should (for obvious reasons) be shifted frequently.

The *store* neat-cattle are also kept in yards by themselves. The manure arising from them is of a very inferior description; and it frequently happens that a superabundance of straw is thrown out of the barn at one time, more than the stock in the yard can tread down properly: Besides, there is not now the same inducement for pigs to rout the straw about in the yard, as there was previous to the introduction of thrashing machines. The barn-door in the *store* cattle-yard is now the principal attraction for pigs; and they in a great measure neglect the other parts of the yard, unless where the stock of pigs kept is so large, that they are compelled, by the imperious law of necessity, to seek for their sustenance in a more distant and less productive station than immediately at the barn-door.

The horse-dung is usually thrown out at the stable-doors, and there accumulates in large heaps. It is sometimes spread *a little* about; but more generally not at all, unless where necessary for the convenience of ingress and egress, or perhaps to allow the

water to drain away from the stable-door. Horse-dung lying in such heaps very soon ferments and heats to an excess: the centre of the heap is burned or charred to a dry white substance, provincially termed *fire-fanged.* Dung in this state loses from 50 to 75 per cent. of its value. The diligent and attentive farmer should guard against such profligate waste of property. The remedy is easy, viz. by never allowing the dung to accumulate in any considerable quantity at the stable-doors. Suppose it was an established rule, that every day, as soon as the yard-man has gone through his regular routine of morning's work, such as foddering cattle, feeding pigs, &c., he should take a horse, or some other draught animal, with a light cart, and remove the horse-dung from the stable-doors, and spread it about the *store* cattle-yards. To this plan will be objected the pleas of trouble and expense. In answer, I have to say, *trouble* should never be considered by industrious farmers; and I think I can readily prove, there will be no additional expense in carrying the plan into effect.—The yard-man having finished his morning's work of foddering cattle, feeding pigs, &c., seldom does more than idle about the yard, and lean upon his fork, until the stock require a second supply of food. His spare time would be more beneficially employed in removing the horse-dung, which, at most, would not be more than half an hour's job of a day. There generally is, or always ought to be, about every farm premises, a light cart, for what is called *odd jobs.* These carts will be very suitable for removing the horse-dung; and as to animals to draw those carts, there are few farms without having one or more idle horses, or other beasts of burden, upon the establishment;—such, for instance, as a favourite old hack-horse; a mule or poney to carry the errand boy; a mare that has a foal, or a horse *a little* lame, and not fit for constant work; an old working ox turned off to fatten; a bull (where one is kept),—a little gentle work would do him good, inasmuch as it would keep him more quiet in the pasture; or even suppose the master or mistress's gig-horse was used occasionally for half an hour of a day, at dung-cart (when not otherwise wanted),—it would be of great service in keeping the horse in regular exercise, and, by that means, prevent fatal accidents which frequently happen where high-spirited gig-horses are not kept in constant exercise.

The dung from the feeding hogsties should also be carted and spread about the *store* cattle-yard, in the same manner as the horse-dung.

Of the proper Form of Dung-Yards, &c.—Opinions are much at variance as to the proper form of dung-yards. Some theorists

recommend the yards to be made so concave as almost to amount to a *well* shape; giving, as a reason in support of their opinion, that the virtues of dung can only be preserved by being saturated in urine, or some other moisture. Others again assert, that dung-yards should be formed convex; and assign as their reason, in support of that form, that farm-yard dung should be kept dry. Practical experience points out, that a medium between those two extremes is the best; and a yard a little hollowed is the most common shape.

Much has been said and written upon the subject of the valuable properties of urine, and of the weepings of farm-yards, as manure for grass land. It has been recommended to collect the whole wash of the farm-yard in reservoirs, and to convey it from thence into the fields in water-carts; but this theory should not be reduced into practice, unless it is ascertained that the benefit to be derived from the manure so conducted covers the expense.

It is a good method (where situation will admit of the practice) to collect the wash of farm-yards into tanks, where a body of water can be thrown into it, sufficient to effectually irrigate some adjoining piece of grass-ground, situate upon a lower level. It is also an advisable method to throw litter, scourings of ditches, and such other refuse, into the tanks, in sufficient quantity to absorb the urine and wash of the yards which run into them. Compost, so collected, is admirable top-dressing for permanent grass lands, or for young clover layers.

Preparing of Dung-heaps.—But to revert to the subject of farm-yard dung: It is a common practice (previous to the dung being drawn out of the yards into the fields intended for turnips) to prepare what are called *good bottoms* for the reception of the muck. This is done by collecting considerable quantities of clay, marl, or such other materials, in heaps, where the dung is to be placed: those bottoms are formed to the squares (length and width) of the intended dung heaps, and are from 12 to 18 inches thick. This is done with an idea, that the juices of the dung will *descend* into the bottoms.—(The fallacy of such reasoning will be pointed out hereafter.)—The bottoms being prepared in the fields, the dung is then carted to them from the yards. In this operation, the materials of the bottoms are pressed down very close, by the carts constantly turning upon them when delivering their loads: the carts are tipped up, and the dung shot out. Men are placed at the heaps, who throw the dung up *lightly* with forks to the height of five or six feet, making the heaps to cover the square bottoms previously formed. In clearing the yards, it is customary to begin

on one side of a yard, going regularly forward, until it is emptied, and then begin on a second; by which means the dung arising from different descriptions of animals is kept apart, and is ultimately applied to the land without intermixture; and as to the horse-dung, *the residue of it* which is left from fire-fang and charring, is considered strong dung; and as it is generally understood that a smaller portion of it than of common yard-dung will answer the intended purpose, it is usually (as a point of economy), to save carriage, taken to the most distant parts of the farm, and this very frequently without any reference to the nature of the soil (whether clay or sand) to which it is to be applied.

Dung-heaps formed in the manner I have described (when the dung is good for any thing), very soon ferment to a violent degree. The gases ascend and evaporate: the juices, alas! in place of descending into the hard beaten clay bottom, as was expected, ooze out at the side of the heaps, and are soon dried up and lost. In a short time the fermentation subsides, and leaves the centres of the heaps burned or charred, while the outsides of the heaps are dried up to chips by the natural effects of sun and wind. In this state these miserably mismanaged heaps of dung remain, until the near approach of the turnip-sowing season: they are then turned over, and the clay bottoms mixed with the dung, a partial fermentation succeeds; and this turning and mixing the bottoms form the only rational part of the manufacturing process; for, by this improvident system, the quality of the dung is not only materially deteriorated, but the quantity very much reduced; so much so, that, by the time the farmer has sown half his turnips, he finds his dung expended: he has then recourse to oil-cake, or perhaps sows a part of his turnips without any manure at all. If the soil is of a nature to produce turnips almost spontaneously, there will be a crop even under the worst management; but when not of that happy admixture, and managed as I have before described, it follows, as a matter of course, that the crop fails: Nevertheless, the farmer is so much of a philosopher, that he consoles himself with the idea that he has done his duty by the land, believing that it is naturally so *unkind for turnips*, that it would be a perfect miracle if he was to have a good crop of them upon such land.

Compost.—Having pointed out what I consider the principal errors in the common method of husbanding farm-yard manure, I will now endeavour to explain my ideas of what I consider a more perfect system; and if I am correct in the opinion I have formed on the subject, I venture to say, there will be no difficulty in producing *upon the farm* a sufficient quantity of yard-

muck or compost to manure the whole of the turnip land upon any farm in a medium state of fertility, cultivated upon the four-course husbandry; and if my premises are correct, the occupier may then reserve the whole of his stipulated quantity of oil-cake for his wheat,—that description of manure being certainly better adapted to the wheat, than to the turnip crop.

As the great object I aim at in the following hints, is to improve the quality as well as to increase the quantity of farm-yard manure, I strongly recommend, indeed I consider it indispensably necessary, that all descriptions of farm-yard dung should, in the first instance, be as intimately mixed together as possible, and that particular attention should be paid to the husbanding of the horse-dung, which should, without fail, be removed *daily* into the store cattle-yards in the manner I have previously recommended. An abundant stock of pigs should always be kept in the yards. No dry straw should be left to blow about the stack-yards: all should be brought into the cattle-yards. Nettles, thistles, and other coarse weeds (not in seed), should be brought into the yards, and not allowed to die and waste in the fields and ditches when they are cut down. The horses kept on the farm should be fed with green food in the yards in the summer months; and they should also be allowed to run loose in the yards in winter, having stables or sheds to go into at pleasure. The yards, stables and sheds, should at all times be kept well littered with straw. The soap-lees from the farm-house should be carefully preserved, and thrown upon the dung in the yards. Saw-dust, leaves of trees, road-scrapings, scourings of ditches—in short, all animal and vegetable substances should be carefully collected, and thrown into the farm-yard.

Forming of Dung-heaps or Pies in Turnip Fields.—When it is found necessary to empty the dung-yards *early in the season*, whether with a view to make room in the yards, to expedite spring work, or to employ the teams in unfavourable weather, when they could not otherwise be employed to advantage upon the farm, I recommend that preparation should be made in the usual manner for the reception of the dung-heaps in the intended turnip fields, viz. by collecting large heaps of clay, marl, or such other materials. The bottoms for the heaps should not be laid above six or eight inches thick of the material; and a large quantity of it should be placed in rows on each side of the bottoms, marked out. The dung should then be drawn out of the yards, and placed upon the bottoms, but not in the usual way of throwing it up *loosely, to cause fermentation*; on the contrary, by drawing the carts with their loads *upon the heaps*, for the purpose of compressing the dung, and thereby *preventing*

fermentation. One or two men (according to the number of teams employed, and distance from the yards), should remain constantly at the heaps while the teams are at work, on purpose to spread and level the dung regularly, so as to render the ascent easy for the succeeding teams as they come with their loads.

If the dung has not been previously mixed in the yards, it should be so in drawing to the heaps, by taking up a few loads from one yard, and then a few from another, alternately; and even from the same yard the loads of dung should be taken from different parts alternately; for the dung is not of equal quality, nor made with the same regularity in all parts of the yard.

The coal-ashes, road-scrapings, and all other collections of manure about the farm-house, should also be carried to the dung-heaps in the fields; and when the heaps are raised as high as convenient for the horses to draw up, several loads should be shot up at the ends of the heaps, for the purpose of making them up to the square of the centre. The whole heaps should then be completely covered with the marl and clay, or soil previously collected in rows by the sides of the heaps; and if there should not have been a sufficient quantity of material collected in the first instance, more should be got ready without loss of time, so as to effectually enclose the dung-heaps in *crusts;* and they are thenceforth denominated *pies.* The dung will be preserved in the pies in a very perfect state, with little or no deterioration or diminution, without fermentation, and without loss by exhalation or evaporation. The pies should remain in this state until within ten days or a fortnight of the time the manure will be wanted for the turnip ground, when they should be turned carefully over, and the crust, top, bottom and sides, intimately mixed up with the dung. When the turning is completed, immediately plough several furrows of the natural soil all around the heaps, and, with the loose earth ploughed up, again coat the heaps all over;—the pies will then take a gentle fermentation; the earth intermixed with and covering the dung will absord the juices and gases of the dung; and the compost come out in a fine state of preparation for using on the turnip land.

Preparation of Manure late in the Spring.—When dung is taken out of the yards late in the spring, or only a short time before it is wanted for the turnip ground, the preparation should in some degree differ from the foregoing, because of the pies or compost heaps having less time for incorporating. I recommend the following process for preparing dung late in the spring. First, let the bottoms and side heaps of earth be provided, in the same manner as for the winter heaps; but the dung should

not be carted upon the heaps to compress them, and prevent fermentation, as in winter; on the contrary, the dung should be thrown up lightly with the fork, upon the bottoms, and the side heaps of earth mixed intimately along with the dung, which answers the double purpose of reducing the straw part of the dung to a proper state for applying to the land, and prevents an excess of fermentation in the centre of the heaps. When the heaps are raised sufficiently high, and extended to cover the squares of the bottoms prepared, the natural soil of the field should be ploughed up all round the heaps, and thrown upon them, in the manner here before directed: the pies will then take a gentle fermentation, and soon be ready for use. The time required for preparing the manure in this manner must depend upon the strength of the dung, and the quantity of clay or marl thrown up along with it. Experience will soon point out the proper quantity of marl to be applied, and the necessary time for the pies to remain before they are used. Turf turned up for a year preceding, on wastes by the sides of roads, makes excellent pie-meat. Good compost heaps applied to land have the effect of renovating soils worn out by arable culture and stimulating manures.

Objections (on the score of expense) will be raised against the system I have recommended; but when it is considered that the greater part of the additional expense is in manual labour, surely that objection should have no weight in the scale, if weighed in balance against the ultimate benefit to the farmer, and the highly creditable method of employing the superabundance of labourers, or excess of population with which the landed interest is at present burthened, in preference to the customary method of supporting the extra labourers and their families as paupers; or, which is much the same thing, employing such labourers in what is called repairing the roads, that is, (according to the common practice), throwing the *dirt* from the sides into the centre, and thereby creating a *job* for some other persons to throw the *dirt* out again.

FOR THE FARMER'S MAGAZINE.

On Winnowing Grain. By J. PARKINSON, jun. Leyfields, Notts.

THIS is a branch of rural economy not so well attended to as is requisite, and particularly so with regard to seed-corn. It need not be surprising that innumerable weeds infest the soil, whilst their seeds are generally sown along with grain and

grasses. Every farmer should carefully examine all his seed-corn, and have it cleaned completely by some means, previous to being sown. The usual practice of superficially examining a few handfuls of grain, ought to be deemed very far from satisfactory. A better practice is, to take any small given quantity indiscriminately from different parts of the parcel, and let it be picked over, which will give the means of ascertaining the quantity of noxious seeds which would be sown on an acre; and show the necessity of more strict attention to winnowing. There may frequently be found upwards of twenty seed-weeds in a Winchester quart of grain, after the grower has declared it is tolerably clean. Many farmers are not aware how they mistake their interest, by sending their grain in a slovenly condition to market; for it is not uncommon that factors, after an unfavourable harvest, make a clear profit of eight shillings and upwards a quarter, by having wheat dressed over in a reeing sieve alone; and some dealers have disposed of large quantities of sprouted and inferior grain, collected from the top of the sieve, which shows their extensive practice of it. The following method has been pursued with considerable advantage, and may be of service to those who have given little attention to the subject; but, in addition to the winnowing machine which is now in the possession of every farmer, the following circular hand-riddles and sieves must be procured, or such of them as are wanted for the different kinds of grain which may be grown. A wheat riddle of 4½ wires, crossing at right angles in an inch each way; a barley riddle of 3½ wires in an inch, and an oat riddle of 1½ wire in an inch; a reeing sieve, called No. 7, of seven wires in an inch, and a reeing sieve, No. 8, of eight wires in an inch, crossing each other as above; which latter are useful for taking the dust from chaff before mixing it with horse-corn, and for various other purposes. The expense of the three riddles and two sieves is from 25s. to 35s., according as they are made for durability.

In cleaning wheat the first time over, put the refuse through the oat or barley riddle as it comes from the spout, (laying aside what is collected in the riddle), which will make it in a more fit state for the second dressing. When the whole quantity is done, then put down the refuse again; and what comes by the spout should be turned in the sieve No. 7. or No. 8, to take out the seeds: the light and sprouted grain may be taken off by hand from the top of the sieve. As the corn is cleaned with the sieve, it may be put to the heap which is going down through the wheat riddle; but it is necessary to leave a small quantity each time, which may be riddled over the reeing sieve, and the

waste still remaining in the riddle to be put aside. As is the usual practice, after straiter riddles are put into the machine, dress the heap over again which was winnowed last (using the hand sieve and wheat riddle), before it is mixed with the best heap. The whole may then be put down the machine again; taking care to sieve the refuse falling from the spout, and, as before, riddle it back to the heap which is going down. The parcel may then be marketable; but, if wanted for sowing, or if abounding with seed-weeds or other rubbish, it would be greatly profitable to have it dressed over again in the same manner. The wires of the machine screen ought not to be so far asunder as to admit any good grain to pass through; and it might then be constantly used to good purpose. It sometimes happens, that those who clean their grain indifferently for market, have a greater proportion of waste or refuse corn, than those who sell their produce in a cleaner state; which is entirely owing to a want of attention when winnowing. Where the above directions are strictly attended to, the least possible waste will be made; for this practice approaches to perfection in winnowing, which is, that all inferior grain and seeds should be separated from the good. A great part of the weeds, sprouted grain and rubbish, may be afterwards separated from the thin grain, which will then be fit for coarse bread, horse or pig corn. It frequently occurs, by the common method of winnowing, that there is a greater value of good corn mixed with the refuse, than would pay for the labour of dressing the whole in a proper manner; and sometimes a sufficient quantity of rubbish is sent along with the marketable produce, so as to deteriorate its value many shillings a quarter. In following the above detailed mode, a trifling expense only will be incurred; as, by the labour of an additional man to work at the sieve and riddle, the machine may be kept in constant motion. The same method is equally applicable to every other kind of grain and seeds. It is of no small advantage to a farmer, when he is enabled to make all the grain he may have grown fit for seed; which certainly may be accomplished, and without great expense. If, after grain has been winnowed, any seeds of weeds remain in the parcel, nearly the whole of them may be separated by the following simple process. Let the corn be well turned in a sieve of sufficient straitness to prevent many, or even any good grains, from going through it; then take off, by hand, what can be collected at the top of the grain in the sieve, which latter must be done by a proper circular motion given to it—an art which some men easily know, yet difficult to be acquired by others. After the grain has been well turned and topped in the sieve, let it be

put through the wheat riddle; taking care to leave a small quantity each time in the riddle, through which the best of it may be shaken to the heap in need of dressing: the refuse at last stopped by the riddle may be put to the other waste corn. Thus, any weeds or rubbish of lesser bulk than the grain will go through the sieve; and wild oats, shepherd's needles, stave-acre, with all other light weeds and sprouted grains, may be taken off the top of the corn in the sieve; or, if any escape, may finally be caught in the riddle.

It must be acknowledged, that more attention is given to the hoeing and cleaning of grain in the field, than formerly; and the drill-system of husbandry is rapidly extending, to the great advantage of those who can discriminate where and in what manner it should be applied: Yet these improvements would be more conspicuous if a better method of winnowing were adopted than is generally pursued.

TO THE CONDUCTOR OF THE FARMER'S MAGAZINE.

On Providing Shelter for Mountain Sheep.

SIR,

IN one of your late Numbers, I suggested the propriety of feeding mountain sheep with hay in the spring months, in situations where it can be raised from their pastures for that important purpose; and I may safely appeal to sheep farmers in general, if their flocks would not have been much benefited by a proper supply of hay during the months of March and April last year, when such vast numbers of them perished for want of food. But as my opinions upon this subject are already in the hands of your readers, I shall proceed to the subject of the present communication, viz. providing a more liberal allowance of artificial shelter for these useful animals.

That mountain sheep, as well as other animals, occasionally require shelter during at least one half of the year, in our climate, is evident from the great losses annually sustained by store-farmers in unsheltered and exposed situations. It is well known to every person connected with the management of sheep upon hill pastures, that they are frequently much hurt by the severity of the weather; and it is much to be regretted, that greater exertions have not hitherto been made for defending them from the overwhelming hurricanes of drifted snows, or the no less baneful blasts of sleety rain, that frequently occur in the winter months, and that drench, and starve, and waste the poor creatures to such a degree, that they either perish of cold and hun-

ger, or are reduced to a state of extreme weakness, and consequently become of little value to their owners. How often has it been observed, that sheep exposed to the severity of the weather have been greatly wasted in condition, while flocks in a more sheltered situation have continued in good order!

Where mountain pastures are not uncommonly well sheltered, by the particular position of the hills, by natural woods, plantations, or other means, they ought to be furnished with a sufficient number of stells on all parts of them, so that the sheep may always find a safe and convenient shelter, without being driven to an improper distance, which, in bad weather, is very detrimental to the flocks, and likewise hurtful to the pastures.

The form of stells for sheltering sheep most effectually from the weather, must vary according to the situation of the ground where they are placed. The round one affords, however, the best and safest shelter in time of a drifted snow storm; the circular form causes the wind to whirl constantly round in time of a violent blast, and thereby prevents the snow from lodging within the walls; and, where the rounds are placed upon level ground, which should always if possible be the case, the shifting of the wind is not at all so hurtful as it would be in other forms of shelter. Sheep may likewise be more conveniently fed with hay in rounds, provided they have proper racks to eat from; and a greater quantity of dung might be more easily collected for the use of the farm. But although rounds seem to be safest and warmest in severe weather, other forms of stells may frequently be of equal benefit. In steep and narrow glens, where there is little level ground, stells in the form of the letter T, with the cross head on the lower end, are very beneficial, as there is always a good shelter either on the one side or on the other. Stells in the form of a C, an H, an S, or many other letters of the alphabet, might all, in places where the ground is suitable, make very good shelter; but the situation of the ground should be the principal director in choosing these forms. Dry ground is, however, essentially necessary for placing stells upon; and, where it is not naturally dry, it ought to be well drained. Sheep-stells should likewise be as easy of access as other considerations will admit of; nor should they ever be placed upon the brink of any steep bank, lake, or running water, as these, in bad weather, may be dangerous where a number of sheep are collected together.

It is of the greatest consequence to have a sufficient number of places of shelter upon sheep pastures, and that they should be placed in such a manner, over the whole farm, that the flocks may be conveniently accommodated without risk or fa-

tigue. On the higher parts, stells are of great use in the early part of winter, before the pastures in these parts are locked up by impenetrable snows, which is often the case for months together, in mountainous districts. Sheep should, therefore, be encouraged to feed as long as possible upon these high parts; and nothing will encourage them more than well sheltered rounds to lie in during the night, or in time of severe blasts of snow and sleet. Again, stells on the higher parts of sheep pastures are of great use in the spring months. It is well known, that that species of valuable food called moss and ling generally grows upon high exposed situations; and as sheep pull these grasses by the root, they are the earliest and best nourishing food to be found upon mountain pastures. Places of shelter should, therefore, always be made near moss land, as, at the season when these moss-grasses are of greatest value, shelter is likewise of the greatest service to sheep, as they are then generally low in condition. Rounds are likewise of great benefit on the high parts of a breeding farm in the lambing season. If the lambs are either newly dropped or weakly, they might be conveniently turned into the rounds during the night, or in time of bad weather. But although stells are indispensably necessary upon the higher parts of sheep-pastures, they are no less beneficial upon the middle and lower parts. In time of a heavy storm of snow, sheep are compelled, by necessity, to abandon the higher parts, and search for food in lower situations, where the snow is not so deep, and the cold not so intense. The lower parts should therefore be sheltered in such a manner, that every sheep upon the farm may have the benefit of a round, or other place of shelter, when necessary; and where hay can be obtained for feeding them in stormy or barren weather, a great saving of that useful article will be effected, by feeding in sheltered situations; and no situation can be more eligible for feeding sheep from racks, which should always be used, than well built rounds of a proper size, upon dry and level ground.

The number of rounds or other places of shelter necessary upon a sheep-farm, must depend upon the extent and situation of the farm. Great care should, however, be taken that too many sheep be not collected to one place, as nothing is more hurtful than a great number crowded together during the night, either in a round, or in any other situation. They can neither be so conveniently fed with hay, nor conducted to and from the pastures with so much ease and safety. Where the position of the hills and other local circumstances admit, there should not above two hundred sheep be collected together either for food or shelter.

Suppose a stell to be built in a proper situation for each hundred sheep upon a farm, and suppose that each of these stells should lodge with ease two hundred sheep; the farm, in this case, might be said to be well furnished with shelter; and no landlord ought to grudge the expense of accommodating his tenants with necessary stells for sheep, any more than with houses and straw-yards for horses and cattle.

It may not be improper to state the expenses that may probably be incurred in providing stells for sheep. We shall confine the estimate to rounds, which are rather more expensive than straight walls, on account of the building. Ten roods of six yards will make a round quite sufficient to accommodate two hundred sheep, where hecks are provided to eat the hay from; and eight shillings per rood, where stones are convenient, will put up a wall five feet high, besides a cope of eight or nine inches of sod. In this case, a round of the above dimensions will only cost four pounds sterling; and, allowing one round for every hundred sheep upon the farm, the interest at five per cent. would be no more than one halfpenny upon each sheep, which is certainly a very small consideration for such a valuable advantage. The interests of landlord and tenant being so closely connected together, should induce them to make improvements that are not only of great service to themselves, but to the country at large.

It must be obvious to every occupier of sheep-pastures, that wood affords the best shelter, and that it ought, in all proper situations, to be cultivated for that as well as other purposes. In laying out plantations bordering upon sheep-pastures, shelter for the flocks should always be kept in view; and in situations where wood can be raised to advantage, rounds and other stells should always be surrounded with it. The sheep-farmer has likewise much occasion for wood for feeding racks, paling, or flakes for enclosing meadows, bughts for sorting, clipping, &c. J. L.

*** We shall be glad to have this Correspondent's sentiments on the subject of roofed stells, or sheep houses, which he will find have been strongly recommended in different parts of the Magazine. It would add weight to his judicious observations, if he could point out instances where the use of the stells he recommends has been resorted to with advantage.—Con.

BRANCH II.

Review of Agricultural Publications.

Art. I. *A Year's Residence in the United States of America, &c.* By William Cobbett. London, 1818.

The most remarkable thing in this little book, is the singular versatility of its author;—the writer of the Political Register become the tenant of a small farm in Long Island, on the coast of New York. He who has maintained, for many years, a constant warfare with Ministers, Lords, and Boroughmongers, and whose name and writings were at one time more than those of any other individual, the subject of general conversation, is now seen working in his fields and garden, without coat, vest, neckcloth or stockings, broiling in the heat of 85 degrees, throwing off three wet shirts a day, lying at night on a bed of straw, and rising with the sun. Instead of spreading discontent and sedition among the operative manufacturers of the West of England, and the *canaille* of London, he is now instructing our brethren of America in the more profitable art of cultivating Swedish turnip, making manure, and feeding sheep, cattle, pigs, and poultry.

Mr Cobbett seems to be a much better farmer than politician; and, if it were not for the occasional outbreaking of the real or affected bitterness of his heart towards the institutions of his native country, there are few farmers even in Britain who might not be gratified by the perusal of his work. It is written in the clear forcible language which he has long been in the habit of employing on very different subjects, and for very different purposes. There seems to be no misrepresentation of facts, no perverse ingenuity in his reasoning; but, on the contrary, a surprisingly minute acquaintance with agricultural practice,—with calculations, by far too sanguine indeed to be realized in ordinary hands, yet not perhaps improbable with the skill and energy which this singular man exhibits.

Of this, the first of Three Parts of which the work is to consist, one chapter is chiefly occupied with a description of Long Island, and a copy of his Journal from the 5th May 1817, when he landed at New York, to the 20th April 1818; and another, with a treatise on the culture, &c. of Ruta-baga. In the suc-

ceeding Parts, 'he proposes to treat of the culture of every other plant that he has found to be of use upon a farm; and also to speak fully of the *sorts* of cattle, sheep, and hogs, particularly the latter.' How far he is qualified for this task, may be gathered from his general Preface, in which he says—

'As to *farming*, I was bred at the plough-tail, and in the Hop-'Gardens of Farnham in Surrey, my native place; and which spot, 'as it so happened, is the neatest in England, and, I believe, in the 'whole world. All there is a garden. The neat culture of the hop 'extends its influence to the fields round about. Hedges cut with 'shears, and every other mark of skill and care, strike the eye at 'Farnham, and become fainter and fainter as you go from it in eve-'ry direction. I have had, besides, great experience in farming for 'several years of late; for one man will gain more knowledge in a 'year, than another will in a life. It is the *taste* for the thing that 'really gives the knowledge.' p. vi.

Though the greater part of the book is occupied with ruta baga, and certainly contains much useful information on almost every thing which it is desirable to know about it, yet as few British farmers can be ignorant of the management and uses of this root, we shall confine our notices to transatlantic topics, among which the labours and reflections of the writer himself are not the least curious. Long Island, in the State of New York, and separated from the city of that name by a very narrow channel, is 130 miles long, and, at a medium, about eight miles broad. Much of its wood has been cut down; there is little water but what is obtained from deep wells; the soil is dry, and apparently much exhausted; and the climate, like that of America in general, and of the Eastern States in particular, colder in winter, and warmer in summer, than in the same latitude in Europe. Mr Cobbett has set himself down about the middle of this island, and sends his ruta baga and other roots to New York. There is no information about the extent of his farm, or the value of land, or the mode of management, or the rate of wages, or the price of produce; and very little regarding its inhabitants. Thus, there remains only the Journal—but from it we may perhaps glean something more characteristic, both of the country and the writer. There is no plant of so much importance, in the agriculture of North America, as *Indian corn*, of which take the following notice, as descriptive of the author's mind as of his subject.

'June 3.—The *Indian corn* is generally come up; but looks yel-'low, in consequence of the cold nights and little frosts.—N. B. I 'ought here to describe to my English readers what this same *Indian* 'corn is.—The Americans call it *Corn* by way of eminence; and

'wheat, rye, barley and oats, which we confound under the name 'of *corn*, they confound under the name of *grain*. The Indian 'corn, in its ripe seed state, consists of an *ear*, which is in the 'shape of a *spruce-fir apple*. The grains, each of which is about 'the bulk of the largest marrow-fat pea, are placed all round the 'stalk, which goes up the middle; and this little stalk, to which 'the seeds adhere, is called the Corn *Cob*. Some of these ears '(of which from 1 to 4 grow upon a plant) are more than *a foot* 'long; and I have seen many, each of which weighed more than '*eighteen ounces* avoirdupois weight. They are long or short, hea-'vy or light, according to the land and the culture. I was at a 'tavern in the village of North Hempstead, last fall (of 1817), when 'I had just read, in the Courier, English newspaper, of a Noble Lord 'who had been sent on his travels to France at ten years of age, and 'who, from his high-blooded ignorance of vulgar things, I suppose, 'had *swallowed a whole ear of corn*, which, as the newspaper told us, 'had well nigh choked the noble Lord. The landlord had just been 'showing me some of his fine ears of corn; and I took the paper 'out of my pocket, and read the paragraph. "What!" said he, '"swallow a *whole ear of corn at once!* No wonder that they have '"swallowed up poor Old John Bull's substance." After a hearty 'laugh, we explained to him that it must have been *wheat* or *barley*. 'Then he said, and very justly, that the Lord must have been a 'much greater fool than a hog is.—The plant of the Indian corn 'grows, upon an average, to about 8 feet high, and sends forth the 'most beautiful leaves, resembling the broad leaf of the water-flag. 'It is planted in hills or rows, so that the plough can go between 'the standing crop. Its stalks and leaves are *the best* of fodder, if 'carefully stacked; and its grain is good for every thing. It is eat-'en by man and beast in all the various shapes of whole corn, meal, 'cracked, and every other way that can be imagined. It is tossed 'down to hogs, sheep, cattle, in the whole ear. The two former 'thrash for themselves, and the latter eat *cob* and all. It is eaten, 'and is a very delicious thing, in its half-ripe, or *milky* state; and '*these* were the "*ears of corn*" which the Pharisees complained of 'the Disciples for plucking off to eat on the Sabbath day; for, how 'were they to eat *wheat ears*, unless after the manner of the "Noble 'Lord" above mentioned? Besides, the Indian corn is a native of 'Palestine. The French, who, doubtless, brought it originally from 'the Levant, call it *Turkish corn*. The *locusts* that John the Baptist 'lived on, were not (as I used to wonder at when a boy) the noxi-'ous vermin that devoured the land of Egypt; but the *bean* which 'comes in the long pods borne by the three-thorned *locust tree*, and 'of which I have an abundance here. The *wild honey* was the ho-'ney of wild bees; and the hollow trees here contain swarms of them. 'The trees are cut sometimes in winter, and the part containing the 'swarm brought and placed near the house. I saw this lately in 'Pennsylvania.' p. 18–21.

'Sept. 9.—We, amongst seven of us, eat about 25 ears of corn 'a day. With *me* it wholly supplies the place of bread. It is the 'choicest gift of God to man in the way of food. I remember that 'ARTHUR YOUNG observes, that the proof of *a good climate* is, that 'Indian corn come to perfection in it. Our corn is very fine. I 'believe, that a wine-glass full of *milk* might be squeezed out of one 'ear. No wonder the Disciples were tempted to pluck it when 'they were hungry, though it was on the Sabbath day!' p. 36.

As an instance of the rapid progress of vegetation, we find *early peas*, sown in the second week of June, fit for the table on the 12th July, thirty days from the time of sowing.

Harvest work, a matter of so much importance, and often of so much difficulty in this variable climate, seems to be a very easy affair in Long Island.

'July 24.—Harvest (for *grain*) nearly over. The main part of the 'wheat, &c. is put into *barns*, which are very large and commodious. 'Some they put into small *ricks*, or *stacks*, out in the fields, and there 'they stand, *without any thatching*, till they are wanted to be taken 'in during the winter, and sometimes they remain out for a whole 'year. Nothing can prove more clearly than this fact, the great 'difference between this climate and that of England, where, as 'every body knows, such stacks would be mere heaps of muck by 'January, if they were not, long and long before that time, carried 'clean off the farm by the wind. The crop is sometimes *thrashed* 'out in the field by the feet of horses, as in the south of France. 'It is sometimes carried into the barn's floor, where three or four 'horses, or oxen, going *abreast*, trample out the grain as the sheaves, 'or swarths, are brought in. And this explains to us the humane 'precept of MOSES, "not to *muzzle* the ox as he *treadeth out the* "*grain*;" which we country people in England cannot make out. 'I used to be puzzled, too, in the story of RUTH, to imagine how 'BOAZ could be busy amongst his thrashers in the height of har-'vest.—The weather is so fine, and the grain so dry, that, when the 'wheat and rye are thrashed by the flail, the sheaves are barely un-'tied, laid upon the floor, receive a few raps, and are then tied up, 'clean thrashed, for straw, without the order of the straws being in 'the least changed! The ears and butts retain their places in the 'sheaf; and the band that tied the sheaf before ties it again. The 'straw is as bright as burnished gold. Not a speck in it. These 'facts will speak volumes to an English farmer, who will see with 'what ease work must be done in such a country.' p. 28, 29.

It has been often remarked, that no animal can endure such a variety of climate and situation as man. What a change in the life of the author of the Political Register since he left the neighbourhood of St James's!

'July 28.—The thermometer 85 degrees in the shade; but *a*

'*breeze.* Never slept better in all my life. No covering. A sheet 'under me, and a straw bed. And then, so happy to have no 'clothes to put on but shoes and trowsers! My window looks to 'the east. The moment the Aurora appears, I am in the orchard. 'It is impossible for any human being to lead a pleasanter life than 'this. How I pity those who are *compelled* to endure the stench 'of cities: but, for those who remain there without being compelled, 'I have no pity.

'Aug. 1.—I take off two shirts a-day wringing wet. I have a 'clothes-horse to hang them on to dry. Drink about 20 good 'tumblers of milk and water every day. No ailments. Head al-'ways clear. Go to bed by day-light very often. Just after the 'hens go to roost, and rise again with them.' p. 30, 31.

In January Mr Cobbett set out for Pennsylvania, to 'appeal 'to the justice of the Legislature of that State for redress for 'great loss and injury sustained by him nearly twenty years ago, 'in consequence of the tyranny of one M'Kean, who was then 'the Chief Justice of that State.' But he was not successful; and this is all he tells us about the matter. On his journey he passed through several places of some note, and thence takes occasion to introduce a greater variety of observations.

'Feb. 16.—Lancaster is a pretty place. No *fine* buildings; but 'no *mean* ones. Nothing *splendid*, and nothing *beggarly*. The peo-'ple of this town seem to have had the prayer of HAGAR granted 'them: "Give me, O Lord, neither *poverty* nor *riches.*" Here 'are none of those poor, wretched habitations, which sicken the 'sight at the *outskirts* of cities and towns in England; those abodes 'of the poor creatures, who have been reduced to beggary by the 'cruel extortions of the rich and powerful. And this remark ap-'plies to *all* the towns of America that I have ever seen. This is a 'fine part of America. *Big barns*, and modest dwellinghouses. 'Barns of *stone*, a *hundred feet* long and *forty wide*, with two floors, 'and raised roads to go into them, so that the waggons go into the '*first floor up stairs.* Below are stables, stalls, pens, and all sorts 'of conveniences. Up-stairs are rooms for thrashed corn and grain; 'for tackle, for meal, for all sorts of things. In the front (south) 'of the barn is the cattle-yard. These are very fine buildings. 'And then, all about them looks so comfortable, and gives such 'manifest proofs of ease, plenty, and happiness! Such is the coun-'try of WILLIAM PENN's settling! It is a curious thing to observe 'the *farm-houses* in this country. They consist, almost without ex-'ception, of a considerably large and a very neat house, with sash-'windows, and of a *small house*, which seems to have been *tacked on* 'to the large one; and the proportion they bear to each other, in 'point of dimensions, is, as nearly as possible, the proportion of 'size between a *cow* and *her calf*,—the latter a month old. But, as 'to the *cause*, the process has been the opposite of this instance of

'the works of Nature; for, it is *the large house which has grown out of the small one.* The father, or grandfather, while he was toiling for his children, lived in the small house, constructed chiefly by himself, and consisting of rude materials. The means, accumulated in the small house, enabled a son to rear the large one: and though, when *pride* enters the door, the small house is sometimes demolished, few sons in America have the folly or want of feeling to commit such acts of filial ingratitude, and of real self-abasement. For, what inheritance so valuable and so honourable can a son enjoy, as the proofs of his father's industry and virtue? The progress of wealth and ease and enjoyment, evinced by this regular increase of the size of the farmers' dwellings, is a spectacle at once pleasing, in a very high degree, in itself; and, in the same degree, it speaks the praise of the system of government under which it has taken place.' p. 63–65.

Mr Cobbett's comparison between an English and American winter, leads him to a conclusion different, we believe, from that of most other writers.

'March 31.—As the *winter* is now gone, let us take a look back at its *inconveniences* compared with those of an *English Winter*—We have had *three* months of it; for, if we had a few days sharp in December, we have had many very fine, and *without fire* in March. In England, winter really begins in November, and does not end till mid-March. Here, we have *greater cold;* there, four times as much *wet.* I have had my great coat on only *twice,* except when sitting in *a stage,* travelling. I have had *gloves* on no oftener; for I do not, like the clerks of the houses of boroughmongers, *write in gloves.* I seldom meet a waggoner with gloves or great coat on. It is generally *so dry.* This is the great friend of man and beast. Last summer *I wrote home for nails to nail my shoes for winter.* I could find none here. What a foolish people, not to have shoe-nails! I forgot that it was likely, that the absence of shoe-nails argued *an absence of the want of them.* The nails are not come; and I have not wanted them. There is *no dirt,* except for about *ten days at the breaking up of the frost.* The dress of a labourer does not cost *half* so much as in England. This *dryness* is singularly favourable to all animals. They are hurt far less by *dry cold,* than by *warm drip, drip, drip,* as it is in England.—There has been nothing *green* in the *garden,* that is to say, *above ground,* since December; but we have had all winter, and have now *white cabbages, green savoys, parsnips, carrots, beets, young onions, radishes, white turnips, Swedish turnips,* and *potatoes;* and all these in abundance, (except *radishes,* which were a few *to try*), and always *at hand* at a minute's warning. The modes of preserving will be given in another part of the work. What can any body want *more* than these things in the garden way? However, it would be very easy to add to the catalogue. Apples, quinces, cherries, currants, peaches, *dried in the summer,* and excellent for tarts and pies. Apples, in

'their raw state, as many as we please. My own stock being gone, 'I have *trucked* turnips for apples; and shall thus have them, if I 'please, till apples come again on the trees. I give two bushels and 'a half of Swedish turnips for one of apples; and, mind, this is on 'the *last day of March.*—I have here stated *facts*, whereby to judge 'of the winter; and I leave the English reader to judge for himself, 'I myself decidedly preferring the American winter.' p. 88—90.

With all his hostility to the government and higher orders in England, Mr Cobbett never ceases to profess the warmest affection for his native country, to which he seems resolved to return; and, notwithstanding his disposition to represent America and its people in the most favourable light, the comparison which he occasionally draws between the two countries, except when political animosity gives a bias to his mind, almost always terminates in acknowledging the great superiority of the former. It is not his purpose, he assures us, to encourage emigration from England to America; like his friend Mr Birkbeck, he only states facts, and leaves his readers to draw their own conclusions. Yet it is impossible not to perceive, that these facts, if his statements be correct, are calculated to make an impression friendly to emigration. In respect to the superior advantages which the Western States are said to hold out to farmers from this country, he seems to differ from Mr Birkbeck, in as much as he thinks the Eastern States abound in eligible situations for the skill and capital of British agriculturists. Mr Cobbett has so long appeared to us as a violent and abusive demagogue, that it gives us pleasure to remark, in several parts of his work, a display of much natural affection for his country and his kindred, —not unmixed, perhaps, with feelings of regret at the conduct which has driven him a desolate exile from his native land.

ART. II. *Holkham, its Agriculture, &c.* By EDWARD RIGBY, Esq. M, D. F. L. S., &c. 2d Edition. Norwich, 1817.

THE name of Mr Coke, the worthy owner of Holkham, has long stood high as an agriculturist,—not merely as an amateur or patron, but as a practical man, entering into all the details of the art, combining profit with pleasure, and setting a good example both as a farmer and a landlord. It would seem, however, that his conduct in both these capacities has not escaped censure. He is accused of having enlarged his farms; of which, it seems, the consequence is, by the use of machinery, to diminish employment, and to lessen the supply of domestic servants, and also of milk, butter, cheese and poultry. So say a Mr

Burgess and the Quarterly Reviewers. It is the principal object of Dr Rigby to answer such objections as these. We had formed a higher opinion of the squires and farmers of Norfolk, than to imagine that such allegations would have been put forth, at this time of day, by any one whom they could think deserved the smallest notice. The question about the size of farms, or the consequences to the public of a system of large or small farms, and the circumstances upon which the diversity of size depends, we imagined had been long since set at rest, not only by means of general principles, founded on the clearest inductions of reason, but by experience, and the observation of every one who chooses to look around him, and examine facts about which there can be no dispute. The right of property itself is intimately, indeed inseparably, blended with the question of occupancy. May not Mr Coke, if he pleases, take all his farms into his own hand, and cultivate them for his own immediate profit? If this would be a wrong thing in a moral or political point of view, why does the law allow of large masses of territorial property being placed in the power of an individual? Instead of making every one a rent-paying farmer, would it not be better to divide landed property into small portions, and make every one an independent freeholder? Or again, as we all know that a farm at a high rent is no very desirable possession, why does not some enlightened Reviewer propose to regulate the rent, as well as the size of a farm, and thus rescue a poor tenant from the fangs of an avaricious landlord? Is there indeed something so superlatively comfortable in the situation of a tenant of 20 or 30 acres, as to supersede all inquiry into the terms on which he holds them? or do we act consistently in leaving the parties concerned to make their own stipulations as to every thing else, while we wish to control them in regard to the extent of farms only?

But, however indisputable may be the right, it is no doubt true that a man may make a bad use of it. He may spend his property in vicious or trifling gratifications, and leave his family beggars; and yet the law does not interfere. If he is a merchant or manufacturer, by means of a great capital he may undersell his neighbours, and thus become indirectly the cause of ruining thousands; and would any one advise that the law should interfere? But if a great landed proprietor takes the necessary steps to improve his estates and increase his income; if he proposes, by the application of capital, to enlarge his produce, and, by the use of machinery, to diminish its consumption on the spot, that he may spare the more for the wants of the general population; Is it to be endured, that he shall be held up to public reproach as an enemy to his country, and pointed out to an unthinking mob as the cause of their sufferings?

It is to this treatment of Mr Coke on a late election that we owe the publication of the present pamphlet, though it was written 'at a time when no remark in it could, of possibility, 'have reference to a contested election; nor was it ever intend-'ed for publication.' We know not whether its effects have been salutary; nor is it necessary to inquire into the merits of Dr Rigby's defence of his friend. The only remarkable thing is, that in such a county as Norfolk such charges should have been moved at all, and, next to this, that it should have been thought necessary to treat them otherwise than with silent contempt. If the pamphlet had contained nothing else, we should have taken no notice of it. But it contains also a number of observations on Mr Coke's practice as a farmer, of which much has been heard in this quarter, and but little perhaps is known. In these Dr Rigby himself does not always display much knowledge of the subject, nor does he communicate any new or striking details of management. But the facts and the general results may, we hope, be depended on as accurately stated; and, in the absence of more ample and better arranged materials, which we hope to procure soon, it may be interesting to many of our readers to know what Dr Rigby has written on 'Holkham and its Agriculture.'

As we could not, by bringing together the several passages which relate to the same subject, present any thing like a complete view of it, we shall take our extracts nearly in the order in which the passages lie before us.

The following is perhaps the best answer that could have been made to those who object to the employment of capital in farming. Dr Rigby rode over the Holkham farm along with Mr Coke, in August 1816; and he thus expresses what he saw and felt.

'My first impression was that of surprise and admiration at the 'exuberance of the crops, at the seeming richness of the soil, and 'at its unexampled freedom from weeds. The first crops which at-'tracted our notice were some extensive ones, both of wheat and 'barley. I had never before seen such. Mr Coke estimated the 'wheat from ten to twelve coombs per acre, and said nearly twenty 'coombs per acre of barley had grown upon it, which is at least 'double the average crop in the county of Norfolk, and nearly tre-'ble that of many counties in the kingdom; and yet so steril was 'this part of the estate considered when he came into possession of 'it, that a large tract of it had been let, tithe free, on a long lease, 'at three shillings per acre; and Mr Coke offered another lease, of 'twenty-one years, at five shillings per acre; but the tenant had not 'courage to take it; and Mr Coke procured him a farm under an-'other landlord. At that time wheat was not cultivated in this dis-

'trict: In the whole tract between Holkham and Lynn, not an ear 'was to be seen, nor was it believed that one would grow. The 'system of farming was wretched, and the produce of the soil of 'little value. What a change has been effected by capital, skill, and 'industry!' p. 2–3.

The fact of nineteen coombs two bushels of merchants' barley, and one bushel of light, having grown upon an acre, was afterwards ascertained by measurement. This is 79 bushels in all, or almost 100 bushels, or nearly 17 Linlithgow bolls the Scots acre,—a produce that may seem incredible to many, especially in so bad a year as 1816.

One great point on which Mr Coke differs from the farmers of this country, is in the drilling of corn crops. It is well known that he is a warm advocate for that mode of culture, which is certainly more practicable upon his light soils, and probably also more advantageous than it has been found to be in some parts of Scotland.

'When the drilling of wheat was first practised, the lines were 'four and six inches distant. Mr Coke now drills it at nine inches 'distance, which admits ample room for horse-hoeing in the spring 'and early summer months, obviously much more effectual in loosening the soil, destroying weeds, and *moulding up the plants*, than 'hand-hoeing, particularly as usually practised by women and girls; 'who, in most instances, by a partial stirring of the earth, and an 'incomplete destruction of weeds, promote the more vigorous growth 'of those which remain. I should however observe, that I have 'since learned from Mr Blaikie, that he does not think it advisable 'to earth up white-straw crops; and therefore, in horse-hoeing wheat, 'he does not recommend *moulding up the plants.*' p. 6–7.

Though Mr Coke seems at last to have adopted what is improperly called the Northumberland method of cultivating turnips,* we have some suspicion that the management is not altogether similar. What sort of horse-hoe is that which may be drawn along by a 'horse briskly trotting,' and performing twelve acres a day; and how is the work done?

'In drilling turnips, Mr Coke has gradually extended his lines on 'ridges, in what is called the Northumberland method, from twelve 'to fifteen, to eighteen, and even to twenty-seven inches. These 'wide drills allow the horse-hoe of the largest dimensions, and of various forms, adapted to the different purposes of turning up the soil 'and earthing up the plants, to pass most readily: As a proof of this,

* It is well known, that the present mode of growing turnips in ridges of 27 to 30 inches, passed into Northumberland from Roxburghshire, where the practice was first introduced by the late Mr Dawson of Frogden, who had no other instructor than Tull.—*Rev.*

'I observed a boy hoeing with the horse briskly trotting, by which 'means he could readily hoe twelve acres a day. Mr Coke's pre-'sent steward, Mr Blaikie, is a good mechanic, and has invented 'some implements which are well adapted, in the best way, to effect 'these purposes.

'This was the first year, 1816, in which the turnips were drilled 'so widely; and Mr Coke expected that the twenty-seven inch dril-'led Swedish turnips would exceed, in weight, those of eighteen 'inches, by ten tons an acre. I saw a large piece of these, about 'sixty acres, in which half were at eighteen inches distance, and 'half at twenty-seven inches; the latter were evidently the largest, 'in the most vigorous growth, and certainly promised to meet Mr 'Coke's expectations. Drilled turnips, however, obviously require 'cross-hoeing, which must necessarily be done by hand; but as this 'is merely to destroy the supernumerary plants, it is easily effected 'by women and young persons.

'The Swedish turnips form his principal and most valuable crop, 'and are sown, upon the best soils, from the middle of May to the 'middle of June; but Mr Coke continues to cultivate, on his light-'est soils, the common and the Scots yellow turnip, both which are 'sown from the middle of June to the middle of July.

'In 1814, Mr Blaikie published some Observations on preserving 'Swedish turnips, by *placing* them, as he terms it; and this has been 'successfully adopted at Holkham.

'They are taken up about the middle of November, or as soon as 'they have attained their full growth; the tails or bulb-roots only 'are cut off, and they are *placed* in an orchard, or on old turf land, 'close to and touching each other, with the tops uppermost, and 'only one turnip deep. An acre of good turnips from the field will 'occupy much less space when *placed* than could be imagined. In 'very severe weather, a slight covering of litter is thrown over them. 'In this way they will keep very well, and be sound and firm in 'June. Those taken up in the spring, when the bulb or fibrous roots 'begin to shoot, and which, if suffered to remain on the ground, 'would greatly deteriorate the soil, may be *placed* in the same way; 'and at this time, if under the shade of trees, the better.' p. 9–11.

It has been sometimes alleged that Mr Coke's practice has proved the advantages of using fresh or unfermented dung for turnips, in opposition to the experience of the farmers of this country. On this point, Dr Rigby affords no information; but from the extracts we have given in this Number from Mr Blaikie's pamphlet, it would appear that the farm-yard manure of Holkham is treated in much the same way as that of the Border counties.

'Mr Coke is liberal in manuring for turnips; he allows not less 'than fourteen loads of manure per acre, the common quantity not 'often exceeding ten loads. He is enabled to do this by manuring his 'wheat with oil-cake, which he drills in with the seed, one ton being

'sufficient for six acres;* and this not only saves time, labour of 'horses, &c. as well as manure, but certainly answers well, as his 'wheat crops sufficiently prove.

'Mr Coke mixes the farm-yard dung in compost heaps, by which 'means he not only increases the quantity, but he seems to improve 'the quality of the manure; so much so, that he now grows better 'crops of turnips upon the Northumberland ridge method, with com-'post manure, and without oil-cake, than he has formerly done, when 'his turnips were sown upon the flat, either drilled or broadcast, with 'all his farm-yard dung in the common method, and a large propor-'tion of oil-cake added to it; and he has the advantage of reserving 'the oil-cake for the wheat crop, to which he considers it more adapt-'ed than to turnips.

'It must however be observed, that, in drilling wheat, he allows 'much more than the usual quantity of seed. Ten pecks an acre are 'the utmost which most farmers drill or dibble, and even six pecks 'have sometimes been thought sufficient; but Mr Coke allows four 'bushels an acre in October, and even five bushels in November. 'He is an advocate for early sowing; and as the drill puts in the seed 'quickly, and, as before observed, no time is lost in carting on ma-'nure, I should think he has seldom much to sow in November. He 'says he has always the best crops when the wheat, by this means, 'is very thick in the rows; and he never thinks it thick enough if he 'can easily pass his finger through the stems near the ground.

'He cuts his wheat very early, even when the ear and stem are 'greenish, and the grain not hard. He says, the wheat, thus early 'reaped, is always his best sample; and he gets two shillings a quar-'ter for it more than for wheat cut in a more mature state. He, 'perhaps, loses something in the measure, the skin being thinner, 'and the grain probably not quite so bulky; but, if this be true, it 'is fully compensated in his suffering no loss by shedding on the 'ground, which, when the ear is ripe and the weather windy, is of-'ten not inconsiderable.

'He is equally early in cutting oats and peas. I observed to him, 'that, in both these, the seeds were not all ripe: His answer was, that 'he should lose more by the falling of the ripe seed at the bottoms, 'than he should gain by waiting until the rest were ripe; and that 'the straw in this state, retaining some immature seeds, was of more 'value to his stock in the yards than if cut later.' p. 13–16.

Except on rich dry loams, or in situations where extra manure can be procured, the four-years' rotation of Norfolk has

* 'In the last season Mr Coke adopted a different method of ap-'plying the oil-cake, which was first practised by Mr Hart, his te-'nant, at Billingford, and which, he thinks, answered better. He 'drilled only half the quantity with the wheat, and the other half 'was drilled between the rows, in the spring, at a time when the plants 'were most likely to be benefited by the additional stimulus.'

seldom been found to answer in this country. It has commonly, after two or three courses, given way to one of five or six years, the division sown with grass seeds remaining two or three years in pasture before it is again brought under the plough. The same change seems to be taking place at Holkham.

'Mr Coke's course of husbandry, that is, the succession of his 'crops, varies but little from that which is general through the county of Norfolk. It is called the four or five course.—First year, 'turnips; second, barley, laid down with clover or other grass seeds; 'third, grass to cut or feed; fourth, wheat. He has, within a few 'years, found it profitable to lay down a certain quantity of land 'with cock's-foot grass, *Dactylis glomerata*; and this lies two years, 'making the course, on this land, five years.

'This grass does not stand for hay, but is excellent sheep feed. 'The summer of 1816 was indeed favourable for all grass land; but 'I never saw a more verdant carpet than it exhibited. When fed 'close, it tillers very much, as we call it, spreads and branches 'on the ground with multiplied stems, and, in the season most favourable to vegetation, it will grow more than an inch in a few 'days. Sheep are very fond of it; and Mr Coke says he can pasture more upon it than on any other layer of artificial grass.' p. 17.

Holkham is just the place where we should expect to hear of experiments in the cultivation of new plants, or such as are but little known to the generality of farmers; yet we find little of this spirit of discovery in Dr Rigby's pamphlet. He saw a crop of mangel wurzel in a good state; and Mr Coke was to make a trial of Heligoland beans on his transplanted turf, which appears not to have been very successful. (see the first article of this Number.) Sainfoin is partially cultivated, and 'has been found a valuable source of hay, and of autumnal pasturage.'

'It was first cultivated in this district in the year 1774, upon 'the Brent-Hill Farm, by Mr Beck, the then occupier. Mr Beck's 'example was followed by Mr Coke, and he has cultivated sainfoin, in Holkham park, about forty years; and some of the huge 'stacks of hay which I saw there were composed of it.

'It is most adapted to thin soils, incumbent on chalk. The seed 'is generally sown *in the pod*, at the rate of five bushels per acre, 'with the barley, after a turnip crop: nine pounds of trefoil per 'acre are sown at the same time. The sainfoin being in pod, attention is required to bury the seed properly. The trefoil produces 'a crop to mow in the following year, and dies away in the succeeding years. The sainfoin is not in full perfection until the third 'and fourth years. It continues good until the ninth year; after 'which it becomes weaker, and is ploughed up for the land to go 'through a regular course of husbandry. The sainfoin is seldom

'manured or top-dressed: it produces a ton and half of hay per 'acre annually, while in perfection. It is never spring-fed, but is 'depastured by all sorts of cattle, to consume the aftermath in au-'tumn.' p. 18, 19.

Of Mr Coke's Live Stock, the notices are very short and unsatisfactory.

'I had little opportunity of noticing Mr Coke's flocks; but they 'are highly estimated, and he is distinguished for his skill and at-'tention in this branch of rural economy.

'His sheep are all Southdowns; but he told me he had not the 'merit of selecting them himself. Some years ago he was visited 'by some gentlemen from the south of England, who found much 'fault with the Norfolks which then composed his flocks; and told 'him, that the sheep in their country, the Sussex Southdowns, were 'much more profitable, and better adapted to his pastures. He 'bought five hundred, on their recommendation; and finding they 'fully answered his purpose, he got rid of his Norfolks, and has had 'none since but the Southdowns.' p. 20.

Mr Coke's cows are of the North Devon breed; one of which belonging to Mr Blomfield, a most intelligent farmer on his estate, produced 13½ pounds of butter weekly, four months after calving. To what extent, and with what success, oxen are employed in labour, is nowhere mentioned.

Plantations for ornament, shelter, and the value of the timber, have not been neglected at Holkham.

'When Mr Coke came to his estate at Holkham, the rental was 'two thousand two hundred pounds—this was forty-one years ago. 'The produce of his woods and plantations amounts now to a larger 'sum; for he has had the spirit and judgment to plant fifteen hun-'dred acres, the greater part of which have become magnificent 'woods, which have not only, by their picturesque beauty, unspeak-'ably improved the landscape; by their protection in checking the 'cold rude winds, so prevalent on this coast, materially softened the 'temperature; and, by the annual fall of their leaves, even contri-'buted something to the fertilization of the soil. But, at this time, 'the annual fall of timber, poles and underwood, from them, aver-'ages about two thousand seven hundred pounds. The timber and 'poles are applicable to most building purposes. Some of them are 'used in the buildings which he is constantly carrying on, upon an 'extensive scale; his houses, cottages, barns, stables, and other 'farming buildings, being all in a superior style of architecture; 'and the remainder is sold in the neighbourhood.' p. 21, 22.

Of Mr Coke as a landlord, report has always been favourable. This gentleman has not found, what in most parts of England will be called long leases, and moderate rents, and a liberal disbursement on farm-buildings, incompatible with the increase of his own income.

'Mr Coke's system of letting his estates is not less excellent than his farming system. A long lease and a moderate rent, cannot fail to be highly advantageous both to landlord and tenant: To the occupier it affords every encouragement to invest capital, and every motive for the skilful cultivation of his farm; and to the landlord eventual permanent profit in the improved value of his estate. The following have been the important results. Mr Coke's tenants are enriched, and his property has increased in value to an almost incredible degree. He gives twenty-one years' leases; and he has already seen the termination of such leases on most of his farms; and, though he continues the same encouraging system of long lease and moderate rent, his present relatively moderate rents, relatively as to the improved state of his farms, have admitted the total increase of his Norfolk rents to amount to the enormous sum of twenty thousand pounds;—an increase in the value of landed property—a creation of wealth probably unexampled, except in the vicinity of large towns, or in populous manufacturing districts.' p. 23, 24.

We shall close this article with one extract more, taken from that part of the pamphlet where Dr Rigby is labouring to repel the charges of the aforesaid Mr Burgess. A few individuals on this side the Tweed, may be heard occasionally expressing the sentiments that are here ascribed to Mr Burgess; but we do not recollect of any instance within the last twenty years, of a man of the least pretensions to enlarged and liberal views, in this country, committing the folly of giving them to the public.

'I could not indeed anticipate the charge against the system of "spreading an insolent defiance of all moral obligation over the kingdom;" and even now, I confess I cannot understand in what way this moral mischief is going on, unless it be, that Mr Burgess thinks it immoral in a farmer to occupy a large tract of land, to live in a large house, and, with a liberal education, to possess the manners of a gentleman, or, to use his own words, of a country squire, thereby immorally going out of his sphere. I own I see no violation of moral principle in all this. I see, and I am pleased to see, an important rise in the scale of society, an improvement in intellect, and an advance in civilization; all which, in my ideas, involve an amelioration in morals.' p. 50.

We forgot to mention, that Mr Coke farms about two thousand acres, and several of his tenants not less than twelve hundred. Yet, so far from having himself increased the size of his farms, there are now twelve more on his estate than when he succeeded to it.

BRANCH III.

Agricultural Intelligence.

The last quarter has been singularly favourable for the important labours of harvest, which have been finished without injury to the crops from wind, rain, or frost. Pastures which suffered so much from drought in summer, experienced a second spring, required an additional stock, and are still abundant. Turnips, where the plants were sufficiently numerous and healthy, have improved greatly within the last two months, and, in most parts of Scotland, are a good crop. Wheat sowing has been performed to a great extent; and the plants, which came up in a few days, have a fine appearance.

We have little to add to the opinion we ventured to state in last Number regarding the productiveness of the late harvest. If we may judge by the rate of prices, Wheat should be nearly an average crop; it is the only species of grain on which there has been a fall since August, as will be seen from the Tables subjoined to this and last Number; though this fall has not, according to the Monthly Returns, extended to Scotland. Oats have remained with little variation; and Barley, Beans and Peas, have advanced considerably. By the average of the six weeks succeeding the 15th August, Wheat having been 79s. 11d., was excluded from all parts between the Eider and the Bidassoa, till a new average be struck on the 15th of the present month. Whether the ports may then be shut for Wheat, is yet doubtful; but it is certain that they must remain open for all other sorts of grain. Beans and Peas are probably above the average produce of ordinary seasons. Potatoes are generally a full crop in Scotland; large quantities have been shipped for London, where the price was at one time uncommonly high. Turnips also seem to be very scarce near the metropolis. We hear of a contract for sending a large quantity of them from the ports of the Frith of Forth for the supply of the London cowfeeders.

Cattle, which began to fall in price about midsummer, have been in brisk demand since our last; and, at the late markets in the North, have been higher than ever. This is said to be owing to the uncommon abundance of Grass in the harvest months, and the mildness of the weather at so advanced a period of the year, Cattle not yet requiring fodder. Yet fodder, and other sorts of winter food, are far from being so plentiful as usual. Sheep, also, have met with a ready sale at higher prices.

At the sale of stock of the improved Short-horned breed of Mr Robert Colling of Brampton near Darlington, on the 29th and 30th September, the following great prices were obtained.

One 2-year old Cow	sold for	-	331 guineas.
One 4-year old Cow	ditto	-	300 ditto.
One 5-year old Cow	ditto	-	370 ditto.
One 1-year old Bull Calf	ditto	-	270 ditto.
One 4-year old Bull	ditto	-	621 ditto.

And it appears by the catalogue, with printed prices affixed, that

34 Cows -	sold for	-	4141 guineas.
17 Heifers -	ditto	-	1287 ditto.
6 Bulls -	ditto	-	1343 ditto.
4 Bull Calves	ditto	-	713 ditto.
61 head of Cattle	sold for	Total	7484 ditto.

At a sale of the late General Simson's stock of the same breed, which took place at his seat, Pitcorthie, Fifeshire, on the 9th October, 12 Cows, 5 two-year old Heifers, 3 Bull Calves, 7 Bulls, 4 one-year old Heifers, and 6 Quey Calves, thirty-seven in all, sold for 1388 guineas. A number of gentlemen from England attended the sale; amongst whom were Mr Curwen, his nephew, Mr Blamire, Mr Thomson, Mr Jobson, &c. These gentlemen were amongst the principal purchasers. Of the Scots gentlemen present who purchased, were, Lords Kelly and Lynedoch, Mr Stuart of Hillside, Mr Bruce of Grangemuir, and Mr Ayton. The stock is considered to be uncommonly fine, as the late proprietor spared no expense or trouble in procuring it, and keeping it free of any improper cross. The English purchasers conceive they have got great bargains.

Average Prices of Corn in Scotland, by the Quarter of Eight Winchester Bushels, and of Oatmeal, per boll of 140 *lib. Avoirdupois, for the four weeks preceding* 15*th October last.*

Wheat 73s. 3d.	Barley 48s. 1d.	Beans 55s. 11d.	Oatmeal 26s. 1d.
Rye.... 55s. 7d.	Oats... 31s. 1d.	Peas 55s. 1d.	Bear or Big 44s. 8d.

Of the Twelve Maritime Districts, for the Week ending 24*th October.*

Wheat.	Rye.	Barley.	Oats.	Beans.	Peas.
79s. 10d.	57s. 7d.	59s. 0d.	33s. 3d.	73s. 0d.	71s. 10d.

Of all England and Wales, for the Week ending 24*th October.*

Wheat 81s. 5d.	Barley 61s. 1d.	Beans 75s. 0d.	Oatmeal 37s. 7d.
Rye... 60s. 2d.	Oats... 35s. 1d.	Peas 71s. 8d.	Bear or Big —

2d November.

SCOTLAND.

Aberdeenshire Quarterly Report.

THE fine warm weather noticed in last Report has continued, without any interruption, to the present date, and the crop was secured in the best order; and although the stack-yards are certainly rather defective in bulk, the produce in grain will be found fully equal to that of an average crop.

Wheat, Barley and Bear, are of unusually fine quality, and, in most cases, would already ship. Oats, although certainly not so plump as we have often seen them, and although one half of the crop was injured somewhat in colour by the soft, damp weather in the end of September, produce well, both from the stack and at the mill—but will not prove so beautiful a sample as the crop of 1815.

Potatoes are an uncommonly abundant crop, and of good quality; and, from their failure in England, have been in great demand for exportation to London, at from 64s. to 90s. per ton. A very large quantity has already been sent away, and many more remain on the merchants' hands, who, at present, do not seem inclined to add to their stock.—Hay has likewise been bought up in large quantities for the London market, at from 10d. to 1s. per stone of 20 lib. Dutch.—Turnips have turned out a very full crop; and some of them, too, have been purchased for shipping to London, at 15s. per ton.—Butter has been unusually high—say 1s. 6d. to 2s. per lib. of 28 oz. avoirdupois.

Grain markets have started brisk—Potatoe-Oats at 23s. to 27s.; Bear 32s. to 36s.; Barley 36s. to 40s. per Aberdeenshire boll of 6½ Winchester bushels. No Wheat of any consequence has yet appeared at market. Oatmeal is in languid demand, at 21s. to 24s. per boll. There has yet appeared only a partial supply of Grain at market, owing to the softness of the weather, which has enabled the farmer to keep his cattle out of doors, and consequently saved the winter provender, which is not likely to be abundant.

Cattle markets, which were dull at the date of last Report, have since revived, and are now very brisk, particularly for the smaller kind of Stock fit for wintering. Year Olds are worth 3*l.* to 6*l.* 10s.; Two-Year Olds 6*l.* to 11*l.*; Three-Year Olds 10*l.* to 15*l.* Queys are high in proportion; and good Fat brings 8s. 6d. to 9s. 6d. per stone of 16 lib. Dutch.

Wages are on the increase; and the situation of the county is improving fast. Land rents are rather looking up, although they continue very far below the mad speculations of 1812 to 1814.—*Oct.* 31.

Ayrshire Quarterly Report.

THE month of August began with remarkably warm weather and clear sunshine, which continued till the 21st, to the great joy of two classes of people—the sportsman and the haymaker; and never before did such crowds of the former take to the hills as this year, to the

great injury of the storemaster's timid flock. Nothing gives the storemaster greater pleasure than to see his landlord, with his dog and his gun, take a few days sport upon his heath-clad mountains, and, with much cheerfulness, he or his servants point out where the game is most plentiful; but when he sees his flocks assailed by tradesmen, with their half-bred dogs, it grieves him to the very heart. I have known a stock of Sheep almost hunted off the farm; and this year I heard of a storemaster, whose Tups, bought at an extravagant price for the improvement of his stock, were so disturbed, that they left the farm; his servants were two days in search of them, and found them at the distance of eight miles. It is true, the storemaster has recourse for damages; but how are these damages to be ascertained? and it would cost him more suing for them, than all that he would obtain. After the 21st the weather became showery, with intervals of dry days, that soon finished the meadow hay-making,—an abundant crop, and well got into the barn-yard. The 9th, 10th, and 11th of September there was frost in the mornings, which did no harm but to the Potatoe-shaws. On the 21st and 22d there was a heavy fall of rain and high winds, and a good deal of Corn shaken. I have seldom seen the Oats freer from the straw than this year. The barn-yards are not fuller this year than usual; but the second crop of Clover was good, and is still cutting, which, with the present mild warm weather, and great growth in the fields, will much relieve us from any danger of a scarcity of fodder. Harvest was finished by the middle of this month, and got into the barn-yards in fine order—not one spoiled sheaf or heated stack but from negligence. The crop in the higher parts of the county is the most luxuriant, as well as the most productive. The warm sunshine in the month of August, when the Oats were at full length, ripened them faster than they filled on the coast; and, there, the boll of eight Winchesters gives no more than sixteen or seventeen pecks of meal; while, on the higher parts of the county, where there was more damp or more copious dews, the boll is producing nineteen or twenty pecks; but this will be all little enough to make up for what they fell short these two years past. It will be about an average crop, as there is much ground in pasture. The summer-fallow never wrought better; and the Wheat has a fine appearance, if the early sown is not too forward. The price of Horses at our Michaelmas fair was low. Black Cattle are in demand, and Fat brings fair prices to the grazier. Sheep of all kinds about three shillings a piece higher than last year; and, from the fine weather, they are much better prepared for winter storms than last year. The farmer's spirits are much revived. He is now obtaining for his sweet-milk Cheese from 12s. to 13s.; skim-milk 8s. to 8s. 6d.; Salt Butter from 26s. to 27s. per stone, tron weight.

Grain has been pretty steady this quarter; Oat Meal from 1s. 8d. to 1s. 9d. per peck, Amsterdam. Potatoes from 9d. to 11d. per peck; Fresh Butter 1s. 8d. to 1s. 9d. Beef from 7d. to 11d. Mutton from 7d. to 9d. per lib. of 24 ounces, retail prices. Quartern Loaf, 1s. 1d. —*October* 28.

Banffshire Quarterly Report.

THE weather, for the last two months, with the exception of a few days, has been highly favourable for harvest operations; and now, even in the latest parts of this district, the Corns are all in the stack-yards, and in the best condition.

The quality of the different Grains appears excellent, and the quantity of produce most abundant.—Barley, in particular, will be found to be of a finer quality and greater weight, than for many years past, some sales of which have already taken place at 35s. per boll. Oats, a very fair crop; and what has been tried, meals far beyond expectation;—present price of Oats, 22s. to 25s. per boll.—Wheat was not in general a luxuriant crop; but the grain appears to be of good quality. Offers have been made for it, from 30s. to 32s. per boll.—Hay has turned out a very light crop, and will be in demand. A considerable quantity has been bought up for the London market, at 1s. per stone of 20 lib.—The Turnip crop, over the whole of this county, is by far the finest ever remembered. A greater quantity of Potatoes was planted this season than ever known—the produce most abundant, and of the finest quality. A large quantity has been bought up for the London market, and some already sent off, at from 3*l.* 10s. to 4*l.* 5s. Sterling per ton avoirdupois. Cattle of every description have been in demand through the season; but, of late, it has turned much brisker, with a very considerable advance in prices.—*Oct.* 28.

Berwickshire Quarterly Report.

THERE has not been one cold day, nor scarcely the slightest frost, during the quarter. The whole of the month of August was uncommonly favourable for bringing every species of crop to maturity; and, from the beginning to the end of harvest, there was very little interruption from the weather. If there be one injured sheaf in the whole county, it is to be imputed to the inattention of the farmer, and not to the season. On the southern borders of the county, harvest commenced as early as the 6th of August. Several fields were under the sickle by the 10th; a much greater number of reapers were at work by the 19th; and it was quite general, except in our very latest situations, by the 24th. In some instances, shearing was concluded on the 3d of September; a great number finished from the 10th to the 12th; and it was generally over, in the middle and lower parts of the county, by the 18th. At the end of the month, there was little to cut even in Lammermuir; and by the middle of October, the fields were generally cleared. Our own people were engaged for harvest work, at the usual markets, at from 14s. 6d. to 15s. 6d. for men, and women at 12s. 6d. to 14s. per week, with victuals. A great number of reapers arrived from the North, and from the West country, who were hired from 9s. to 11s. per week, with victuals.

The bulk in the stack-yards is not equal to that of ordinary years; but as every kind of grain is plump and sound, the return in bolls

may be stated at an average. Wheat, after a fair trial, turns out far beyond expectation, both in quantity and quality; and may be stated as equal to crops 1805, 1813, and 1815. Barley, with some exceptions, is a fair average, and nearly equal to our best years in the weight of the grain. Oats, with many exceptions, were rather light on the ground; but they rise well on the barn-floor, and give nearly meal for corn, that is, eight stones per boll, some without, and others with, mill-dues. There are instances, in the immediate vicinity, of a return of more than ten bolls of Oats per English acre. On very dry soils, however, they are rather short of the produce of ordinary years. Peas are equal, both in quantity and quality per acre, to the average of any crop for the last twenty years. Beans are said to be a fair crop; but may not perhaps make a return equal to Peas. Turnips, which are still pushing away rapidly, are a fuller crop, except where fingers and toes prevail, than in almost any year in our remembrance. In several instances, Stock were put upon them before the end of September; and generally, both in the fields and at the stall, by the middle of this month. Some have been taken at 6d. a head per week, for wedders, to be eaten on the ground; but we have not heard of more than two or three fields let by the acre, one of which brings 8*l.* per acre; but the Turnips are to be carted off the field. Potatoes, on proper soils, particularly where they were planted dry, turn out a full crop, and of excellent quality; but on clay soils, where they were planted when the land was drenched, they are deficient. This most valuable root has afforded great relief now for three months, to all who felt the pressure of the grain markets. The price of this article has been enhanced by purchases for the London market; but this speculation is supposed to be now nearly at an end. Owing to the fine season, and the absence of frost, Potatoe-shaws have retained their verdure longer than usual; and we observe many Potatoes that are taken up parting still very freely with their first skin. Every hand, however, has been busy for the last ten days in taking up this root, and storing it for the winter. From *one* potatoe planted *whole* in a cottager's garden in this vicinity, about which fresh earth was collected two or three times during the summer, one hundred and five potatoes were taken up, and a great proportion of them were of a large size.

Sound Stock of all kinds is in very good condition; and, owing to the fresh growth upon the pastures, has improved greatly since the beginning of last month, particularly on the high lands. Sheep, in consequence of scarcity, and the high price of Wool, have been much in demand, and bring extravagant prices. Lean Cattle also, which were rather dull sale in August, are now brisker sale, at considerably more money. At Melrose fair, August 12th, there was a quick demand for Lambs, at prices fully equal to preceding markets. At Dunse fair, on the 26th, the show of Cattle was smaller than for many years past; and there were scarcely any dealers from the South. Lean cattle were, of course, very little in demand; and

those that were sold, brought considerably less money than in the summer markets. Fat was from 8s. to 9s. per stone Dutch, sinking the offals. At Dunse new Sheep fair, on the 22d of September, there was a fair show of draught Ewes and Wedders. Bred Ewes sold from 35s. to 42s.; and Cheviot ditto, which were not so much in demand, from 20s. to 24s a head. Wedders were not equally brisk in sale; yet several lots went off at fair prices, for laying on turnips. At St Ninians, in Northumberland, the show of Ewes was not great; and prices of bred ditto from 40s. to 50s. a-head At Earlston fair, on the 15th current, there was a good show of cattle; and a fair demand for Lean Stock, both for turnips and the straw-yard. At the beginning of the market high prices were asked, and the sales were slow; but, as the day advanced, they became brisker, and the greater part was sold at prices from 20 to 40 per cent above those of the same fair last year There was very little Fat, and prices nominal. The show of Horses was small, and little demand. At Wooler, on the 17th, there was a good show of Sheep; a ready market, and few left unsold. Bred Dinmonts, 38s. to 52s.; Cheviot Wedders, 30s. to 40s.; Bred Ewes, 35s. to 45s.; and Cheviot ditto, 24s. to 28s. a head. Owing to the fine season, there has been an uncommon growth on the pastures; and new Grasses never had a better appearance. The Wheat has been put into the ground in the best style; and the braird, in many instances, already covers the clod.

The Grain markets, which started considerably since the beginning of harvest, are again on the decline. Wheat and Barley have fallen fully 3s. per boll, and Oats about 2s.; and, during the quarter, may be quoted,—for Wheat, 46s. to 63s.; Barley, 34s. to 43s.; Oats, 23s. to 29s.; and Peas, 44s. to 55s. per boll of six Winchester bushels. Oatmeal, 52s. to 60s. per load of 16 stones Dutch; sold in retail at 3s. 4d. to 4s. Barley and Peas ditto at 2s. 8d. to 3s. 2d. per stone. The Quartern Loaf is 11d.; and the average price of the sack of Flour 60s. The shearers' dinner-loaf was 3d. Great prices are expected for the produce of the Dairy, particularly for Butter; but they are not yet fully settled. The farmer who sold twenty Cheviot Rams at 100*l.*, as mentioned in our last Report, has since sold six Rams of the same breed at 49*l.*

The change of the times is now visible in the countenance of every agriculturist. Farms are more in request, at improved offers of rent; and there is some danger that the clouds which have so lately dispelled, will be forgotten in the sunshine of the passing hour.—— *October 24th.*

Dumfriesshire Quarterly Report.

THE fallacy of human opinion was never more strikingly exhibited than in this season and its results. The weather throughout the whole summer, according to universal estimation, was what was best calculated to bring to perfection, and in the greatest abundance, every production of the earth. It was the theme of admiration to every

one; and no person doubted but that the consequence would be fullness even to overflowing. As the season advanced, however, these fine expectations were somewhat abated; for it became obvious that Corn crops were at least rather thin and deficient in length of straw. But it was not till harvest, that the full extent of the failure was perceptible; and it is now too evident, in the small number of small ricks in every stackyard. The weather in harvest, too, was upon the whole good; there were rains, to be sure; but they were not of such frequency or continuance as to cause any damage, or even to retard, for any length of time, the stooks from being put into rick.

If any one crop approximates to an average, it is Wheat. It appeared thin on the ground, and short in straw like the others; but is so universally free from disease, and so heavily headed, that the produce will probably not fall much short of that of ordinary years.—Oats do not compensate in the barn for their want of bulk in the yard; nor, it is believed, will they yield at the mill in any extraordinary manner. The crop of Barley is the most miserable one that has grown in this century. If it is equally light in other quarters of the kingdom, it will be a scarce article indeed.

The state of the crop, as here described, must be understood to relate to the lower parts of the county. In the higher, Corn, in comparison with late years, is plentiful, and of good quality, having ripened fully as well as on the earliest grounds. If this is the case, (as it is understood to be), in all the elevated districts throughout the kingdom, it will have very material influence in keeping Corn at a moderate value; though none, or at least no great quantity, may be brought to market from these districts. If none is needed by them from the lower lands, a considerable part of the usual demand will be wanting.

Farmers will have to look well to their Fodder during the ensuing winter. It is not easy to see how the ordinary stock of Cattle can be kept, even where the strictest economy is exercised.—Rye-grass Hay is selling at from 1s. to 1s. 3d. per stone—an enormous price at this day of the year!

Potatoes are rather a weighty crop, and the quality is excellent; a blessing undoubtedly to every one, but especially to the poor, whose chief article of food they constitute.

Live stock of every sort is in request, and brings high prices.—Young Cattle, in particular, are extremely scarce and dear.

There have been hitherto no sales of Grain to any amount, so that prices are perfectly nominal.

Cattle and Sheep fit for the butcher market, are not exceedingly plentiful; of course they sell pretty well.—*Oct.* 31.

Fife Quarterly Report.

HARVEST was generally begun throughout the county of Fife by the middle of August last. The weather was uncommonly favourable, and allowed victual of all descriptions to be cut down in the finest order; and, with the exception of a few of the hill farms, it was

wholly secured in the barn-yard by the middle of October uninjured by either wind or rain. Our suspicion of scarcity of fodder, owing to the excessive heat through the summer, is fully realized in the appearance of the stack-yards; which, compared with the preceding year, are greatly deficient in bulk. But this scarcity chiefly extends to farms naturally dry. On wet farms, the deficiency is comparatively small.

Wheat is of an excellent quality, and greatly superior to last year's crop.

Barley, a very great crop, and of good quality,—supposed equal in value to the two preceding years.

Oats, very thin on the ground, but the quality good.

Peas and *Beans* very good in quantity and quality.

Turnips, universally good, indeed very fine.

Potatoes the same, quality excellent, and all taken up without damage, from either wet or frost.

Flax, far above an average crop, and quality good.—The season allowed the fallows to be properly done up, and the New Wheat to be sown in the most favourable circumstances; and the young Wheat appears at present to be sufficiently thick, and of a fine healthy colour.

Hay, owing to the drought, is not so plentiful; but of a good quality, the price from 9d. to 10d. per stone.—As to the prices of grain, the demand for Barley is brisk, and the price from 31s. to 38s. per boll, according to quality, which will support the spirits of the farmer, and prevent many from sinking altogether from the losses sustained by two previous bad crops. Wheat has never reached 40s. per boll, generally from 35s. to 38s.; which is certainly moderate. Oatmeal 24s. and 25s. per boll, and appears to continue steady.

Manufacturers are all in full employment; and the wages of all descriptions of labouring classes sufficient to keep them comfortable, if judiciously laid out, and not so high as to enable them to be either idle or intemperate: And, to all appearance, nothing like scarcity or dearth is to be apprehended.

It is presumed that the high price of Barley in Scotland is entirely owing to the accidental failure of that crop in England this season; and that there is not the least reason to expect the price would have reached 25s., if the crop in England had been as good as usual.

Forfarshire Quarterly Report.

Patches of barley began to be cut, on some dry gravelly soils, about the middle of August; and harvest became general in this county before the middle of September. Towards the end of that month, a tract of rainy and hazy weather set in, which has continued, with a few intermissions, ever since. At that time, about a third of the crop was in the stook, or uncut. We had, in fact, two harvests; 1st, of what had been sown before the heavy rains in May; 2d, what had been sown after they abated, some of which was not

inserted until the middle of June. The late warm hazy weather caused a good many stacks to heat, and a good deal of corn to grow in the stook. Excepting a few patches on the higher grounds, our fields are now all cleared. The rains, however, very much refreshed the pastures and the turnips, especially those that were latest sown, whose growth had not stopped. This has raised the price of cattle higher than ever, which had been some time on the decline, from the scantiness of pasture, and apprehension of a deficiency of winter keep.

It would be premature to offer any opinion concerning the comparative value of the crop that has been reaped. In general, it may be observed, that all our different species are far from being bulky, either in straw or grain. But the grain is of an excellent quality, highly farinaceous, and replete with nutritive matter. The wheat is far from being abundant, but is of uncommon good quality. Barley is the least abundant of all our crops, but never was known to be of better quality. It is remarkable, that what was sown after the heavy rains in May abated, yields double, and in some cases triple the quantity, from the same extent of land, than the return from barley sown in April. The competition of brewers and distillers to lay in stocks, has raised the price of barley to 40s. and upwards; and much of it has been already thrashed and sold off. Last year, the average return of meal from oats, was from 12 to 14 pecks to the boll. This year the worst oats return meal for corn; and some have yielded 17, 18, and in a very few cases 20 pecks from a boll of oats. Our boll of meal is 8 stones Amsterdam, and the peck is the 16th part of 8 stones. Our pulse crops, like the others, are small in quantity, but excellent in quality. The Potatoes are not near so abundant as they were last year; but they are highly farinaceous and nutritive. The heavy rains in May prevented about a third of the extent from being planted that was intended. There was lately a great demand at our sea-port towns for potatoes and turnips to the London market, which raised their price very high. But we learnt since, that that market has been completely glutted with these articles, which has restored the prices to the usual level. In general, the prices have been looking up; which is an uncommon circumstance at the close of harvest.——*28th October.*

Letter from Glasgow, 28th October.

Since the commencement of autumn, the weather has, upon the whole, proved extremely favourable for all the operations of husbandry. In this district, the general harvest was finished so early as the latter end of September. Although the labour both of reaping and ingathering was frequently interrupted by slight showers, yet these being for the most part but of short continuance, and uniformly followed by sharp piercing winds, all sprouting was effectually prevented, and crops of every description were soon housed in the best possible order. The appearance in the barn-yard is not so great, in general, as might have been expected, from the uncommon excellence of the weather; but the produce in the mill is fully equal to an aver-

age in quantity, the quality being of the finest description. The former remark, however, is not applicable to Oats grown on the moorlands, which constitute a considerable part of this district. The natural sourness of such soils being corrected, and their superfluous moisture dried up by the great and long continued heat, their produce this season has been equally remarkable for the bulk of straw, and the quantity and quality of the grain. The summer-fallows were finished and sown in the finest condition. We have seldom seen such a rapid vegetation as has been exhibited in the young Wheats. So mild and genial was the weather when they were committed to the ground, that the blade appeared in the course of eight or ten days; and some of the fields have already assumed the verdant appearance of meadows in the spring months. A continuance of the same excellent weather has enabled the farmer to take up his Potatoes in good condition. This useful esculent is, like the general produce of the season, of very superior quality, and of a size somewhat larger than usual. A great proportion of the potatoe-land has been already sown; and, notwithstanding the occurrence of a few heavy showers, the weather still continues to favour the preparations for the Wheat seed.

Since harvest, prices have declined, and sales become dull. This is to be ascribed to our abundant supplies from the adjacent country, and our extensive importations from Ireland. These circumstances, together with the earliness of the harvest, and the excellence of the crop, render it highly probable that the price of every description of grain will continue moderate for two or three months to come.

Present State of Glasgow Market.

Old Foreign Wheat	35s. - 42s.	per boll of 240 lib.
Do. British Do.	38s. - 40s.	
New Do. Do.	39s. - 43s.	
Scots Barley -	38s. - 42s.	per boll Stirlingshire measure.
Berwick Do. - -	42s. - 44s.	
Irish Do. -	38s. - 39s.	
Do. Old Oats -	24s. - 27s.	per boll of 264 lib.
Do. New Do. -	25s. - 29s.	
Scots Do. Do. -	24s. - 28s.	
Old Beans -	38s. - 40s.	per boll Stirlingshire measure.
New Do. -	34s. - 36s.	
Gray Peas -	32s. - 34s.	
Oatmeal -	24s. - 25s.	per boll of 140 lib.

Inverness-shire Quarterly Report.

THE last, like the preceding quarter, has been remarkable for the warmth and the general dryness of the weather. A more favourable season for the early and effectual ripening of the fruits of the earth, is not remembered by the oldest of our acquaintances, some of whom are 90 years of age. During the last and the present month, however, we have had several days of very foul weather; but, neverthe-

less, excepting in some few elevated situations, where the soil is spouty, the harvest is completely finished; and, in general, it may be said that the grain was stacked three weeks ago in all the plains and straths.

With regard to crops, though there are examples of most abundant returns, the grain, upon the whole, does not exceed the amount of a fair average; and the quantity is by no means what might be expected in so remarkably favourable a season. This deficiency arises from the general inferiority of seed sown during the last spring; but, although the quantity is considerably less in some respects, the quality, with few exceptions, is *excellent*. As might be expected in so dry a season, Straw is short, and at least not above the average quantum. For the same reason, Hay, though of good quality, has not been abundant; but Turnips are unusually productive, and of excellent quality. Potatoes are everywhere fine, but do not exceed an ordinary return. The operation of ploughing is advanced; and what Wheat has been sown, promises well. The circumstances and prospects of the farmer are also meliorated, by a considerable advance in the price of Cattle. At the recent Trysts, the prices exceeded those of the preceding fairs from 15 to 20 per cent. Great numbers were exhibited, and bought with avidity. Our farmers, however, have not yet recovered from their difficulties. The losses sustained during the last three years have been of such magnitude, that probably two or three years of prosperity will be necessary to restore the stability of their circumstances. It may not therefore be considered surprising, that there are still extensive farms untenanted, and that rents are not advancing. Indeed, the reduced rents are not yet regularly paid; and, on some estates, it may be believed that arrears to a considerable amount will never be collected.

The laws against illicit distillation have been enforced with a *vigour* bordering on *rigour*. This was necessary to check deeds of violence in resisting the Excise-officers, of which several instances have occurred. But smuggling is, notwithstanding, undoubtedly increasing; and legal distillation is certainly not extending. *The real fact is,* that the duties are still too high; and that, under the irksome restrictions and regulations of the Excise laws, few can engage in the trade. Accordingly, the inhabitants of this town are under the necessity of using Leith whisky, which, without offence to your neighbours of that busy town, must be admitted, to say the least of it, to be far inferior to the Highland spirits. Barley, in these circumstances, will therefore obtain but an inadequate price. The Chancellor of the Exchequer would undoubtedly find, that a reasonable reduction of duty would rather increase than diminish the revenue derived from that branch of trade. We have pleasure in stating, that the northern landholders are about to plant forest trees to a great extent. The demand for plants is increasing. The benefits which the country will derive from this species of improvement, will be great indeed. It would be easy to show, that, in *this country alone*, the value of

property might, in thirty years, be enhanced, by planting, to the amount of more than one *million sterling*.

There is little alteration in the Grain market here since last Report. Oatmeal is 2s. per boll less. Owing to the rise in the price of Cattle, Butcher meat is higher.—*24th October.*

Kincardineshire Quarterly Report.

HARVEST, as was anticipated at the date of last Report, commenced about the middle of August, and, before the end of that month, was pretty general over the county. By the second week of September, more than a third of the crop was cut down; part of the Wheat and Barley stacked; and the Oats in most instances ready for the sickle. Oats being this year mostly all of the potatoe and early varieties, were, in consequence, nearly as soon ripe as Wheat or Barley; and, in several situations, were partly harvested even before these crops; and I do not recollect to have seen more of them drop off in the shearing, even at the commencement of harvest, than this year. In numberless instances, between shaking and shearing, nearly *a seed* fell to the ground. Had September continued dry and favourable throughout, harvest would have been almost finished within that month; but the rains in the latter part of it, and during the present month, have extended it much beyond expectation, as there is still some small part of the oats in the field in the late districts. A large proportion of the crops in this quarter is now cut by the threave, which, independent of the opportunity of employment it affords to both old and young, is, in seasons like this, when the various crops ripen almost all at one and the same time, preferable to the old mode of engaging a limited number of reapers, who are frequently found unable to keep pace with it. In the north-east district of the county, it is the uniform practice with the farmers not to hood their stooks, whatever sort of weather it be; but this custom is generally disapproved of by their Southern neighbours, who reckon it very hazardous, and, consequently, never adopt it except to a very limited extent, when the harvest is early, or the weather very fine.

The grain crops of this year are complained of as of very small bulk, but generally allowed to be yielding remarkably well to the straw; and the grain, but especially Wheat and Barley, in so far at least as secured previous to the rains, is of very superior quality. A large proportion, however, of the latter part of the crop is damp; and, although not materially injured, is inferior in every respect to that previously secured. In almost no instances does the crop exceed two-thirds of last year's bulk, and in many not more than a half; but, considering the smallness of the straw, and the fulness of the ear, it is not improbable there may be nearly an average return of grain; and there being still not a little of the straw of last crop unconsumed, and a good appearance of Turnip, there is no great reason to apprehend any general scarcity of winter food: And moreover, Pastures continue unusually fresh and luxuriant for the season.

Oats seem to yield tolerably well to meal; but, on certain soils,

they are reported to be somewhat small. A considerable quantity of our Barley is already thrashed out and disposed of, at from 38s. to 41s. per Forfarshire boll, (the measure always understood in these Reports, unless otherwise mentioned); and the market continues lively for dry samples, which are weighing from 18½ to about 19½ stones per boll. Cattle and sheep continue in fair demand at greatly improved prices, in comparison with some former years; and Fat Swine have lately been much inquired after, and brought from 6s. to 7s. 6d. per stone sink.

Potatoes are tolerably productive, and of fine quality, except on some heavy, wet soils, where they have partly failed; but, owing to the unfavourableness of the weather, most of them are still to take up. The autumn-sown Wheats have made a fine braird, and are generally in a forward state.—*24th October.*

Quarterly Report for the Stewartry of Kirkcudbright.

At the end of this quarter, the substance of our Report ought to consist in summing up the returns for the whole of the agricultural labours of the year; which (thank God), not as in the two last years, we can now say are safely lodged in the barn-yard: And although the crop is very considerably deficient in bulk, yet, in other respects, we are of opinion that it will amount to something near an average. Wheat, for instance, will be rather more, and excellent in quality; Barley and Oats less. Barley good in quality—Oats deficient, from the want of moisture in the latter part of July and early in August, having ripened prematurely before they were properly filled. Potatoes have turned out far above an average crop, both in quantity and quality; so that I hope we shall be able to assist our Southern neighbours, where that crop is so very deficient from the long continuance of the dry weather. Turnip has also turned out a very good crop; the rains having come seasonably to preserve the plant, and afterwards to bring it to maturity. In consequence, Lean Stock has very much improved in price since the commencement of this quarter. Sheep and Wool also continue at the high prices they have been at for some time past. The prices of the natural productions of the country, meeting with ready market at fair (or rather high) prices, has given a stimulus to the industry of every class of the community. The shades of a melancholy gloom are dispelled—no complaining for want of employment—and the labourers' wages are very much improved.

The fine weather still continuing, the Seed-Wheat has been committed to the ground under the most favourable auspices; which allows us to indulge sanguine hopes of the future crop.

Prices of Grain—Wheat, from 8s. 6d. to 9s. 6d. per Winchester bushel; Barley, from 6s. to 7s. ditto; Potatoe-Oats, from 3s. 6d. to 3s. 9d.; Oatmeal, from 2s. 10d. to 3s.; Potatoes, from 9d. to 1s.

Butcher Meat—Beef, from 5d. to 7d. per lib. of 16 oz.; Mutton, ditto, ditto.——*28th Oct.*

Lanarkshire Quarterly Report.

THE weather has been uncommonly fine during the harvest quarter now ending; indeed, it has been in a great measure to the farmer's wish, from the middle of the month of May to the present day. The crop has been reaped and secured, the Potatoes dug up, the Wheat sown, and every operation of husbandry performed, with uncommon ease, and in the best possible condition—in so far as depended on the state of the weather.

Wheat and *Oats* are both above a medium crop, and the grain is of excellent quality; but the Oats are not bulky in straw. *Potatoes* were seldom, if ever, so abundant; and they are of the very best quality. *Apples* have been above a medium crop; but *Pears* have come rather short of an average return. *Pasture* has been so productive, that grazing will turn to good account. The Dairy Stock have made abundant returns; and the price of Dairy produce was never higher.

Cheese is bought wholesale from the farmers at from 12*s.* to 12s. 6d. per stone, and sold in retail, at present, at 10d. per pound of 22½ oz. New, or Fresh Butter, is retailed at 1s. 10d. per pound; and Salted Butter at 24s. to 26s. per stone. And as Dairy Cows of the best sort yield, when properly fed, generally about two thousand pints of milk in the course of every season—as fifty-five, or from that to sixty, pints of milk will generally give a stone of cheese—and as *eight* pints of milk will, on an average, yield a pound of butter, and the sour milk sells at a penny per pint—the return of a Dairy Cow of the best quality, and well fed, must be much greater than is generally believed beyond the bounds of the Dairy district, and far above what can be realized by the grazier in fattening cattle for the butcher.

Many of the Dairy Cows do not yield so much as 2000 pints of milk in the course of the year; and some of them not more than the half of that quantity. But wherever the Cows are of the best quality, in good plight, and well fed, they will yield generally about 2000 pints of milk per annum. It is quite common in the Dairy districts, to let out for a year the milk of the whole cows on a farm, ten, fifteen, twenty, or more in number, in what is locally termed a *bowing*; that is, the owner furnishing the cows their pasture, fodder, and food for a year, and the tenant, or *bower*, performing all the labour, drawing and manufacturing the milk, and selling the produce; taking his chance of markets, and every other risk. And the rent in such cases paid to the owner is, generally, from 10*l.* to 15*l.*, according to the quality of pasture and excellence of the stock; and in some instances 17*l.* 10s. has been paid for each cow, good and bad, (and some of them must always be inferior), of a large stock. Many of the most active farmers who are conversant in dairy husbandry, and who have the best pasture, will tell you, that they would not keep a cow that did not yield her own weight, or her own value of cheese, every year. And certainly the good Dairy

Cows will average from 15*l.* to 20*l.* of price; and weigh from 24 to 30 stones. These are understood to be the very best of cows, in proper condition, and well fed. Those that are inferior, or feed on worse ground, will not yield so much. None who have had experience of dairy husbandry, have ever called, or will ever call, these statements in question. But some who are strangers to that branch, and to the dairy district, have attempted to show, that the additional expense of feeding consumes the produce. This is by no means the case. A Dairy Cow is reared to 2½ years old, as cheap as one of the same age and size for the grazier. Any difference is in their food after they come into milk. A good Dairy Cow will require from a sixth to a fourth more pasture in summer, and perhaps double the expense in winter food, of *yell* stock. But her return is in all cases double, and generally near three times, that of a cow fattened for the butcher. Dairy Cows of inferior size or quality, and that give less milk, are, in proportion, cheaper fed.

Another circumstance respecting the Dairy, and which shows the advantages of extending it, is, that while the average price of grain has scarcely been doubled, since the beginning of last century, that of dairy produce has advanced from three to four hundred per cent. within the last 40 or 50 years. Sweet-milk or full-milk Cheese was little known, even in the district of Cunningham, till about the year 1770. But there are people still alive, who have seen the couple (a stone of skim-milk Cheese, and a stone of salted Butter, Ayrshire weight, 24 oz. per lib. and 16 lib. per stone) sold as low as 5s. Till about the year 1770, Butter was sold in Kilmarnock market, at from 4d. to 4½d. per lib. and about the year 1780, good sweet-milk Cheese brought only 4s. 6d. and 4s. 8d. per stone. Now, the Butter sometimes sells at 2s., and Cheese has lately been retailed at 1s., and some of it as high as 1s. 2d. per lib. And if it were not for the Butter and Cheese imported from Ireland, England, and the Continent, they would be both still higher, at least when mechanics are well employed.

It may be impossible to overcome the prejudices in certain quarters on that subject, by mere argument; but, when their pecuniary interest is evidently so much concerned, it should have greater weight.

The dark cloud that has hung over the heads of farmers for some years past, begins to be dispelled, and the spirits of that valuable class of the community are reviving. But the capital of farmers has been greatly reduced, and many of them driven out of the circle, and reduced to the condition of labourers. Last year alone reduced by far the greater number of farmers on the verges of the moor districts, and those that occupied land of an indifferent quality, to great difficulties. But this crop will relieve them more than it will those who occupy better lands.—*28th October.*

Letter from Langholm, 28th October.

The season has been singularly favourable to the interests of the farmer since the date of last Report. The latter part of summer, and the beginning of autumn, we had a long course of fine, dry, warm

weather. About the beginning of the present month, we had some heavy rains, but of no long continuance. The crops, in general, are fully equal to an average. Oats, in many instances, have been rather thin on the ground, owing to a failure of the seed the preceding year; but, where the ground was in good condition, they improved to the period of reaping. In high lying, moist soils, this crop has been most abundant; but in dry gravelly soils rather short of straw, the grain in general being of good quality. Barley is a fair crop; but the breadth of ground sown with this grain is less than usual.—Peas have likewise given a good return. The crop of Potatoes is every where excellent; and the quantity planted last season has been very great. Turnips, except in a few partial instances, have proved a good crop, and the sown Grasses present a very healthy and thriving appearance.

The Grain Markets here have not experienced any material alteration during last quarter; but other articles of food have advanced in price. Butcher Meat is scarce, and, of consequence, high priced, being at present from 6d. to 7d. per lib. and upwards. Butter, at one period of the season, got excessively high; but is at present more moderate, the retail price being 14d. per lib. Potatoes are now selling at 3d. per hoop by retail. The prices of Live Stock, both of Sheep and Black Cattle, have been very high during the season, with an uncommonly brisk demand; but we dare scarcely calculate upon the continuance of these prices, as things must certainly be out of their natural course, when the Lean Stock is selling fully as high, if not higher, than those of the same weight when fed. At no former period within our recollection, have the prices of Lean Stock been higher than they are at the present moment.

The Labouring classes here complain heavily that their wages at present bear no proportion to the price of victuals, and that their earnings afford nothing beyond what goes to cover the expense of food. It is, however, a fortunate circumstance in their favour this season, that there is such an abundant supply of Potatoes in the country, which are considered as quite sufficient for their consumpt till another crop comes off the ground; unless that wholesome and nutritious article of food should be wastefully expended in feeding stock for the Butcher. The report of the complete failure of this crop in the south of England, had, at one period, a considerable influence upon the market, and Potatoes were eagerly bought up at an advanced price; but they have now got back to their former level. The high prices given for Stock, and every article of agricultural produce, have already produced a corresponding rise in the price and demand for land, which, from some late sales, appears to be an article more eagerly sought after than for some time past.

East Lothian Quarterly Report.

HARVEST commenced by the second week of August in the lower district; and, in ten days after, was general throughout the county. The weather was most favourable for the very important operations of that season, as the occasional showers that fell were uniformly suc-

ceeded immediately by heat and gentle breezes, which allowed both reaping and carrying to proceed in the most speedy and satisfactory manner. Of course, shearing in general was finished by the middle of September; and, by the second week of the present month, even the latest of the Bean crop was safe in the stack, perhaps without an exception. The stackyards are undoubtedly less bulky than usual; nevertheless, as the whole was secured without any loss either by rains or shaking winds, it is very probable that the crop in general will amount to a full average. Wheat is of the finest quality, 64 lib. per firlot is a very common weight; 65 and 66 lib. per firlot are not very rare; and, from some of the rich land in the neighbourhood of North Berwick, the produce has been found to weigh even 68 lib. by the standard firlot of that burgh. But Wheat of such superior excellence is seldom indeed to be met with in Scotland. Barley, likewise, is of superior quality, as 80 lib. per firlot is a very common weight for that grain. Oats are perhaps the most defective of any of the grain crops of the county, as, besides the deficiency in straw, the produce per acre is hardly an average; and the quality, generally, is undoubtedly inferior to ordinary seasons, eighteen pecks of meal per boll being about the greatest quantity obtained from even the potato species; and very few, even from the best soils, will produce that quantity of meal. But, on the other hand, Peas are certainly a most excellent crop, as they have been ascertained to yield fully ten bolls per acre, where half that quantity was considered like an average of ordinary seasons. Beans are very short in the straw, but they are well podded; and, at all events, the quality will be fine. In addition to a fair average produce, prices of grain have been good for the part of the crop already disposed of; and every article presented in the market has found a ready sale, Wheat fetching from 35s. to 45s. per boll; current prices about 40s. to 42s.; Oats from 24s. to 28s.; Peas (chiefly of an early species) from 26s. to 32s.; and Barley, for which a very brisk demand has regularly existed, from 38s. to 42s. A little of very fine quality has brought a shilling or two more, as inferior qualities have brought less; but the prices quoted are what have been freely given in the most extensive sales to distillers, &c. Potatoes are good both in quantity and quality; but the price has been considerably enhanced by the demand for the London market, although recent prices, viz. 12s. and to 16s. per boll cannot now be so readily obtained.

The weather, during the whole of the quarter, has been particularly genial and delightful; and vegetation has gone on, even till now, with a vigour sometimes hardly experienced in summer. The second crop of Clover has thereby been more than ordinarily valuable, and the later sown Turnips have improved in a manner almost unprecedented; while the young Grasses among the Wheat and Barley stubbles are so luxuriant, as even in some cases to have been cut with the scythe, and carted home to feed the draught-horses. Last week the thermometer was 64° in the shade.

Prices of Fat Stock have remained stationary for some time past, with a ready market for fine quality; Beef bringing from 8s. to 10s. per stone, and Mutton from 6d. to 7d. per lib. Lean Cattle and Sheep are higher than last season, the latter having advanced about 30 per cent., which renders the profits from Turnip feeding very doubtful. It is highly gratifying, however, to notice the much improved prospects of the farmer, as well as of the labouring classes. While the fair crop and good prices are so favourable to the interests of the former, plenty of employment, with improving wages, are no less consolatory to the latter, as a labourer in want of work is rarely to be met with now in this district.

A better season for Wheat sowing could not have been desired. All the fallows were finished some time since, and are already covered with the richest verdure; and the greater part of the Bean stubbles are also sown under the like favourable circumstances.—23. *Oct.*

West Lothian Quarterly Report.

The last quarter has proved favourable for every species of grain and Grass crops. Seldom do we remember to have got all the grain cut and stacked in better condition. The Potatoes, which are an abundant crop, have all been taken up safe, and put up in good order for the winter store. Turnips, in this district, promise to be a full average crop. Seldom has the second crop of Clover been so abundant, having been cut for horses up to this date, not the least injured by frost. For one or two mornings, there was a gentle hoar-frost upon the grass; but we have seen no ice yet.

We do not remember to have seen the Wheat crop so plump and well filled when so thin a crop of straw was on the ground. Moderate heat and dry weather in the filling season, have made the quality good; although I question if it will reach an average crop as to quantity. The Oats are small in the grain, although they seem to meal pretty well. They were generally thinner on the ground this season than usual; perhaps in many cases owing to inferior seed, that of last crop not being always good. The Barley turns out to be an average crop. The Peas and Beans have not been so full a crop in this district for some years. Upon the whole, the bulk of straw is less than ordinary, which will be felt in the article of dung for next year's crop. The weather, at present, is so moderate and fresh, that the Cattle are all still thriving on the Pastures as in August.

The prices of both Lean and Fat Stock have all got up from 20 to 30 per cent. above last year's prices. Butcher Meat is from 5d. to 8d. per lib. of 17½ oz.; Tallow 12s. 6d. per stone, and it is thought will be higher.

Prices of Grain at present—Wheat, from 37s. to 40s. per boll, four bushels Winchester; Barley, six bushels do. from 37s. to 40s.; Oats, 24s. to 26s. same measure; Oatmeal, 1s. 6d. to 1s. 9d. per peck of 8 lib. of 17½ ounces.

The young Wheats have a luxuriant appearance, and the Clovers have made a rapid growth since the grain was taken in.—26*th Oct.*

Morayshire Quarterly Report.

HARVEST became general in the last week of August, and was finished about the end of September. We had a good deal of broken weather for so early a harvest; but the Corn was all secured in excellent condition. Any loss that was sustained was by high winds, by which a good deal was shaken in the later fields of Oats. For a long time the Wheat kept remarkably free of every kind of disease; but, latterly, a good many fields were touched by mildew. The quality, however, is in general very good; the quantity, we think, is rather below an average, many fields having been exceedingly thin of plants. Barley is still more defective in quantity, having suffered very much by the severe drought, except where it was late sown, and was not too far advanced before the rains of July: it is excellent in quality. Oats, though short in the straw, are a good crop. So are Potatoes; but no great quantity is grown for sale, there is so seldom any demand for them here.

So fine an October is not remembered; the Wheat has been laid down in the finest possible mould, and the braird is far advanced. Rain has been wanted for the Turnips, which are mostly all whitened in the leaves, and consequently stunted in their growth. With more rain they would have swelled to a great size, in so mild an autumn; but, as it is, they are a fair crop. Fodder will be scarce. The stack-yards have not been so small-sized for several years. The stocks of Cattle, however, are perhaps proportioned to them. Cattle have been constantly advancing in price. *Winterers* are difficult to procure, and have cost a deal of money.

Little has yet been done by our Corn merchants. Some Barley has been sold from 35s. to 40s. per boll, and some Oats from 30s. to 34s. per five firlots. Potatoes fetched from 12s. to 16s. per boll; but the demand for them has ceased. Hay sells from 8d. to 9½d. per stone.

One novelty here we have seen with particular pleasure—we allude to the example set by the Earl of Moray in letting the farms on his estate of Alves, of building suitable steadings at the commencement of the lease, the tenant paying so much more rent per acre as the farm is thought more valuable for it. There may have been instances of this in the county before, but not to any extent. In the common way here, an entering tenant is obliged to lay out so great a part of his capital in houses as generally disables him from improving his farm. Every body who regards the improvement of the country must rejoice at the dawn of a better system.—*26th October.*

Perthshire Quarterly Report.

AT the date of last Report the weather had assumed rather a threatening aspect, from the great quantity of rain that fell towards the end of July; and fears were entertained about the safety of the heavy crops. Happily, however, these fears were soon removed, by a tract of fine weather which set in with August, and continued during the greater part of the month. Up till the 25th, there fell only about one-tenth of an inch of rain; and, from the elevated tempera-

ture, the ripening process went on with great rapidity. By the close of the month, a great proportion of the Wheat crop was safely under cover; and both Barley and Oats were, in general, fit for the sickle. In every respect the month was as favourable as could possibly have been desired. While the thermometer rose every day at least to 60°, and sometimes as high as 75°, it never sunk during the night lower than 43°; so that none of the crops were in the slightest degree injured by frost.

The month of September commenced with showery weather, but was, upon the whole, rather favourable than otherwise for the harvest, up till the 20th; after which, it rained a good deal. By this time, however, a great proportion of the crops was in the barn-yard; though some patches of late Oats and Barley were still uncut, or in the stook. This must be understood chiefly of the earse and earlier districts; for, on the hilly grounds, a great deal still remained uncut; and of this considerable apprehensions began to be entertained. By the end of the month, the Potatoe crop began to be taken up; and a good deal of Wheat had been sown some weeks before.

The first week of October was moist and open, but favourable for completing the Wheat-seed. About the middle of the month it rained a good deal; but the last fortnight was uncommonly mild and warm. The temperature of the whole month, indeed, was unusually high; the thermometer frequently rising above 60°, and only once sinking below 40°. The young Wheat has made a more rapid progress than was ever perhaps known at this season; and the Pastures have been covered with fresh verdure. In the Highland districts, however, where a great proportion of the crops is still in the fields, the weather has been very unfavourable, owing to the absence of sunshine, and the general dampness of the atmosphere. Cold frosty weather is what must be looked to as the only chance of saving the crops there, a great deal of which has already been much injured. In this quarter, the Potatoe crop has all been secured in safety.—The following is the abstract of the weather for the last quarter.

	Number of Fair Days.	Number of Rainy Days.	Quantity of Rain.	Mean Temperature.
August	25	6	.690	56.6
September	13	17	2.660	52.8
October	16	15	1.957	51.6
			5.307	53.6

The rain in the corresponding quarter last year amounted to 7.651, being 2 inches and 3-tenths more than this season; and the mean temperature was only 49.8, being nearly 4 degrees lower.

The character of the different crops has now been pretty accurately ascertained. Wheat is excellent in quality, but below an average quantity. Barley is equally good, and fully an average. Oats deficient both in quantity and quality; the best yielding only about 14 and 15 pecks of meal. The Potatoe crop has turned out better than

was expected, especially such as were planted after the heavy rains in the beginning of May. Still, however, they are rather below than above an average.

The markets have been looking up of late. Present prices—Wheat 35s. to 40s.; Barley 34s. to 39s.; prime samples 40s.; Potatoe-Oats 22s. to 25s.; Common 20s. to 23s.; Quartern Loaf, 1s.; Oatmeal, 1s. 8d. per peck. The demand from the London market for Potatoes, raised the price of that article as high as 18s. and 19s. per boll, but it has since sunk to 12s. and 14s.—*2d November.*

Ross-shire Quarterly Report.

We never had a finer harvest. Crops of every description, and in all situations, have arrived at full maturity, and been secured in excellent order. The bulk in the stack-yards is supposed to be one-fourth under that of an average; but the generally sound and excellent quality of the grain will furnish a full average for human sustenance.

Wheat is, in many instances, of fine quality, and will yield a large produce; but as the plants stood thin on some fields, the quality of such will have a tincture of coarseness; and, in these cases, the quantity of the grain will also be deficient.

Barley is an abundant crop, and of excellent quality.

Oats, owing partly to bad seed and a steril seed season, were with some a thin crop, and the quality proves lighter than expected. A very limited quantity having yet been mealed, we cannot say with accuracy how they will yield in that respect.

Pease and *Beans* are expected to yield a full average produce, and to be of good quality; but the extent which was sown is inconsiderable.

Potatoes are uncommonly productive; and this, coupled with the consideration that all kinds of crop have attained maturity, and been saved in the late Highland districts, will, it is expected, obviate the necessity which has existed for the two last years of importing considerable quantities of meal. There has not been any thing of consequence yet done in effecting sales of the new crop. The farmers are busy with the wheat seed under the most propitious circumstances. Not only is the land in the finest tilth, but the weather is as genial as if it were the month of June. We have no signs of the approach of winter, excepting in the days shortening, the fields being cleared of corn, and the gradual decay of the foliage. Pastures and young Wheats wear the brightest verdure; and cattle are roaming in the fields as in the middle of summer. Turnips are a good crop, and still improving from the fineness of the weather.

Our Cattle markets were much affected by the drought in England, which caused a depression of from 20 to 25 per cent. in August and September. But prices have again risen to that extent, good stock at our last markets being in brisk demand at from 8s. to 9s. 6d. per Dutch stone sink.——*28th Oct.*

Quarterly Report for Tweeddale.

Owing to the situation of this county, many weeks intervene from the commencement to the termination of the harvest. The Tweed

runs through the county for more than thirty miles. The arable land upon both the north and south sides of the river for twenty miles, is generally fertile and early. The arable land on the sides of several of the streams running into Tweed for some miles up these streams, is equally fertile and early. On these lands the harvest generally commenced about the last week of August, and was finished the third week of September. Some few farms were rather earlier. But taking the county as a whole, it may be said that harvest was not completely over till the second week of October. We had frequent interruptions from rains, which kept it longer on hand; but these were always succeeded by drying breezes; and yet not so strong as to do much damage by shaking. I do not recollect a harvest in which the crops sustained less damage either in stook or stack. We had few fields of Oats free of aftergrowth, which may be owing partly to early kinds of seed, and partly to the drought in May and June. Our Oats and Barley are not so bulky; but they prove well to the bulk on the barn-floor. The Oats are small, and do not meal so fully as I expected. Except the Potatoe-Oats, few of the other kinds yield eight stones Dutch in meal from the Linlithgow boll. Barley seems to be good in quality. I have seen some of what I reckon the medium kind in the county, that weighs nineteen stones Dutch.

Owing to the scarcity of seed, the greater part of our Peas crop is from English seed. They had an excellent appearance till the pods began to form upon them: They then put on a sickly, pale colour, and many of them filled very indifferently.

The Potatoe crop is abundant, and excellent in quality. To the best of my remembrance, we have not had an autumn so free of frost these twenty-five years; of course, the aftergrowth of both Clovers and Pastures of every description continues good. The Turnips, about the middle of September, appeared to apple poorly; but the continuance of fresh, mild weather has brought them on, so that they may now be stated to be fully an average crop in this county.

The Hill Pastures in Tweeddale are generally not of a strong growth, the soil being mostly thin, and abounding in heath growing on an earthy soil;—that produced from peat-moss is comparatively of small extent; but our pastures are generally healthy, and keep a compact, sound, healthy stock. There is hardly ever an instance of a stock in the county being infested with the rot, unless the season be uncommonly wet, or the farm under bad management. If the mild soft weather continue much longer, I very much doubt that most fatal diseases will break out amongst sheep fed on strong, rich pastures.

The prices of both Stock and Grain are not local, but general. I should suppose they differ little in all the counties south of the Grampians; of course, they are well known. Lean Stock is fully one third higher priced than it was in August last year, the cause of which I will not venture to explain.

In August last large parcels of Lambs passed through this county on their way to the North, which indicated a want of Stock of that description in that quarter; but, since that time, immense parcels of

aged stock, of both Sheep and Cattle from the North, have passed through this county on their way to England.——*28th Oct.*

ENGLAND.

Letter from Cumberland, 28th October.

THE state of forwardness for sowing Wheat promises a good crop next year. The Wheat of this year is not an average crop; and Oats and Barley are by no means good. Potatoes are a good crop, and Turnips excellent. Cattle sell high—Horses not so well. The meeting at Workington was not so well attended as on former occasions. This was occasioned by the harvest, which prevented farmers from attending. Mr Curwen's crop this year is above an average; and his crop of Swedes very weighty, 38 tons per acre being the best he ever had. His Potatoes are not so heavy as on former occasions. He has covered his Turnips with heath, which is a most excellent plan for saving straw, the scarcity of which is very great this year. Such a plan is well calculated for those districts which adjoin the mountains, where heath can be procured in great quantities. The District Meeting in the Holm has been well attended, and very useful. The exertions of our President continue undiminished; and he must soon be in possession of one of the most valuable stocks of Cattle in the kingdom. Cumberland is improving very much, and has been greatly indebted to our President, Mr Curwen.

Letter from the Neighbourhood of Lancaster, October 28.

ONE of the finest summers is now succeeded by a still more delightful autumn. Although this part of the county suffered little from the drought, in comparison with many counties south and east of it, and consequently had a regular growth of Grass, yet such is the warmth and mildness of the season, that the Pastures keep improving. The thermometer has generally been from 54 and 55 to 60 in the shade. The heat was greater yesterday than we have experienced it for several weeks. I was not able to observe the thermometer, having been from home; but should think it could not be less than 64 or 65. The weather has now been dry for a week, which has enabled us to get Potatoes, and sow Wheat. The former turn out a good crop, and have fallen in price from 6s. to 4s. 6d. per load of three bushels, or 224 lib. The Wheat, which is principally up, looks uncommonly well, and is likely to be too forward, if the winter be mild. Grain, in the early districts, was secured in fine condition, with trifling labour; but the growth of high situations, and the late sown mosses, had repeated soakings before it could be harvested, and fears were entertained that a considerable quantity would be wasted. Wheat is computed to be an average crop, and of very fine quality. Barley nearly an average. Oats will fall considerably below one, though they prove well at the mill. Beans are a miserable crop, except on land well adapted to them. Turnips are looking well, but do not get to the same size that they frequently do. Our markets have been pretty steady for several weeks, till the last market day, when Wheat advanced from 6d. to 9d. per bushel, there being but a

small quantity. Wheat is 11s. 6d.; Barley 7s. 6d.; Oats 4s. to 5s. Many were disappointed at the Cheese fairs on the 10th and 24th at Lancaster, there not being that demand which they anticipated. Many Dairies were sold for 74s. to 76s. per 120 lib. Cattle of all descriptions sell very well; but for Horses there is little demand. Beef is 7d. to 7½; Mutton 7d. to 8d.; Butter 1s. 5d. per 18 oz. Labourers 2s. and 2s. 6d. per day.

The Garstang Farmer's Society held their annual Meeting and Show on the 24th September. The Premiums awarded are as follow—

To Alexander Whitehead, the Premium of Two Guineas, for a crop of Red Clover of the first year.

Samuel Hinde Esq. Two Guineas, for a crop of Turnips to be consumed on the farm.

Robert Whiteside, Two Guineas, for a crop of Potatoes.

David Hawthornthwaite, a Cup, or Three Guineas, for a Long-horned Bull of any age.

Jonathan Binns, a similar premium, for a Short-horned Bull.

Joseph Fielding Esq., ditto, for a Long-horned Heifer.

William Thulfall, ditto, for a Short-horned ditto.

Samuel Hinde Esq., Two Guineas, for a two-shear Leicester Ram.

Jonathan Binns, ditto, for a pen of two-shear Leicester Ewes.

Robert Whiteside, a Cup, or Three Guineas, for a two-year old Colt.

John Whiteside, ditto, for a two-year old Filly, or Mare.

The subscribers and the public were much gratified with the Stock shown, particularly the Leicester Sheep, which were large and beautiful animals. They afterwards dined at the Royal Oak—Joseph Fielding, Esq., President, in the Chair—where the evening passed very agreeably to all parties.

Sweepstakes at the Garstang Meeting.

Ram, any age,	- -	Jonathan Binns.
Ewe, any age,	- -	Ditto.
Yearling Ewe,	- -	Ditto.
Yearling Ram,	- -	William Thulfall.
Tup Lamb,	- -	Samuel Hinde Esq.
Ewe Lamb,	- -	David Hawthornthwaite.

The annual Show and Meeting of the Lancaster Agricultural Society took place in Lancaster on the 10th October. After the inspecters had viewed the Stock, the Society retired to the Town-hall to receive their award, as follows.—

To Charles Gibson Esq., a Cup, or Five Guineas, for his Improvements by draining.

John Drinkall, a Cup, or Three Guineas, for a crop of Red Clover of the first year.

James Seed, a Cup, or Three Guineas, for Pasture Seeds of the first year.

Richard Morland, a Cup, or Three Guineas, for soiling Cattle and Horses.

Charles Gibson Esq., a Cup, or Three Guineas, for a crop of Turnips.
Thomas Jackson, a Cup, or Five Guineas, for his stock of Cattle.
George Dixon, a Cup, or Three Guineas, for a crop of Drilled Beans.
William Watson, a Cup, or Three Guineas, for a two-year old Long-horned Heifer.
Samuel Hinde Esq., a Cup, or Three Guineas, for a two-shear Ram, of the Leicester Breed.
Jonathan Binns, a Cup, or Three Guineas, for a pen of two-shear Leicester Ewes.

Sweepstakes.

Best Long-horned Cow, -	William Watson.
Short-horned ditto, - -	Charles Gibson, Esq.
Yearling Short-horned Heifer,	Ditto.
Ram, of any age, - -	Samuel Hinde, Esq.
Yearling Ram, - -	William Thulfall.
Tup Lamb, - - -	Charles Gibson, Esq.
Ewe Lamb, - - -	Ditto.
Ewe, any age, - - -	Jonathan Binns.

The subscribers dined at the Commercial Inn, Charles Gordon, Esq., President, in the chair. Richard Atkinson junior, Esq., Vice-President. Several agricultural topics of importance were discussed, and eleven new subscribers admitted. They enjoyed each other's company till a late hour.

Letter from Liverpool, 26th October.

THE only new Grain we have yet had in our market (with the exception of what has been brought in by the neighbouring farmers) has been from Ireland—chiefly Wheat and Oats. The quality of the former was never better,—mostly brown, and very similar to fine Rostock Wheat; the latter weighs light, but is fine in colour, and, in other respects, of good quality. We have had no opportunity in judging of the qualities of Barley or Beans, but they are represented to be very fair in quality; but, like most kinds of spring-grain, are said to be deficient in quantity. If, however, we are allowed to judge of the quantities already come and coming forward from Ireland, no room is left to draw any such conclusion, at least in regard to that part of the United kingdom; and we are inclined to be of opinion, that we shall be pretty well supplied from thence until the summer months set in.

The partial shutting of the ports for Wheat between the rivers Eider and Bidassoa, seems to have no effect on either our market or that of London; both, of late, keep gradually declining, owing to the continued large foreign imports. This declension may, however, prove an ultimate benefit to the trade, as it certainly tends very much to insure the general shutting of the ports against Wheat after the 15th of next month; but they are sure to continue open for all other kinds of Grain, &c.

Since we last addressed you, we have had a very good demand for Foreign Wheats, American Flour, Oats, Beans, &c. into the interior; but old Irish and Scots Wheats have continued almost unsaleable. We have also lately had a fair demand for new Wheats and Oats; and,

were there any new Barley suitable for malting in the market, it would sell readily. We are without any new Beans. Old advanced very considerably some time back, from an idea that the very dry weather had much injured the crop; but they are now much lower. Old Oatmeal has been, and still continues to be, in good demand for feeding —New also goes off very freely. Of late, we have had some demand for American Flour—principally for exportation; but have had less demand for home use, since New Flour became so plentiful and of so very good a quality. The quantity of Sweet is now not heavy; but of Sour, it is very considerable—supposed to be upwards of 100,000 barrels. That must all go for manufacturing purposes; and the demand being considerable, keeps its price astonishingly.

Current Prices on Saturday, 24th October, 1818.

Wheat,	For.	10s. 0d.	-	10s. 6d.	fine	11s. 0d.	11s. 6d.	very fine	Dantzic,	12s. 0d. - 12s. 6d.	70 lib.
"	Eng.	11s. 6d.	-	11s. 9d.	new	11s. 6d.	12s. 0d.	-		12s. 0d. - 12s. 3d.	
"	Scotch	9s. 6d.	-	10s. 0d.	fine	10s. 9d.	11s. 3d.	new,	none.		
"	Irish	9s. 0d.	-	9s. 6d.	—	10s. 0d.	-			11s. - 11s. 6d. - 11s. 9d.	
Barley,	Foreign	-	6s. 0d.	-	6s. 6d.	suitable for malting,				8s. 0d. - 8s. 6d.	per 60 lib.
"	English, new,			-		ditto				8s. 6d. - 9s. 0d.	
"	Scotch and Irish, none.										
Beans,	Foreign,	-	-	-	70s.	-	75s.	fine,	-	76s. - 78s.	per Quarter.
"	English,	-	-	-	60s.	-	65s.	—	-	68s. - 74s.	
"	Scotch and Irish, none.										
Peas,	white boiling,			-	70s.		76s.	fine to	-	84s.	per Quarter.
"	grey hogs,	-	-		60s.	-	62s.	—	-	64s.	
Malt,	English,	-	11s. 9d.	-	12s. 0d.	fine,	12s. 6d.	- 13s. 4d.	—		per 36 quarts.
Oats,	Irish, old,	3s. 9d.	4s. 0d.	fine,	4s. 4d.	-	4s. 8d.	new,	4s. 6d. - 4s. 10d.		per 45 lib.
"	Scotch,	4s. 4d.	-	4s. 6d.	—	4s. 8d.	-	4s. 10d.	new,	none.	
"	Foreign,	4s. 0d.	-	4s. 2d.	—	4s. 4d.	-	4s. 6d.	—		
Oatmeal,	English, new,	-	42s.	-	44s.	fine,	45s.	-	46s.		per 240 lib.
"	Irish, old,	-	32s.	-	34s.	—	35s.	-	36s.		
"	Scotch,	-	-	34s.	-	36s.	—	37s.	-	38s.	
Amer.	Flour,	Philadelphia,		46s.	-	47s.	—	48s.	-	50s.	per barrel of 196 lib.
"		Baltimore,	-	44s.	-	46s.	—	47s.	-	48s.	
"		New York,	-	40s.	-	42s.	—	44s.	-	45s.	
"		Sour,	-	38s.	-	40s.	—	41s.	-	42s.	

IMPORTATIONS *of* GRAIN, *&c. into the* PORT OF LIVERPOOL, *from the 27th July* 1818, *until the 26th October* 1818, *inclusive.*

Date	Description.	QRS. Wheat.	QRS. Barley.	QRS. Oats.	QRS. Malt.	QRS. Beans.	QRS. Peas	QRS. Rye.	Flour, 240 lib.	Oatmeal, 240 lib.	Barrels Amer. Fl. 196 lib.
Aug	Coastwise	1,686	—	3,041	1,273	370	27	—	—	81	—
	Irish -	930	995	29,494	—	111	—	—	—	6,431	—
	Foreign	26,715	3,252	1,631	—	4,153	2,585	1,631	—	—	8,610
Sept.	Coastwise	128	10,960	301	4,289	524	50	—	—	336	—
	Irish -	11,492	90	27,195	—	436	—	—	230	3,454	—
	Foreign	10,930	110	1,146	—	1,625	28	225	—	—	825
Oct.	Coastwise	859	858	671	3,630	468	—	—	713	3,482	—
	Irish -	15,109	856	29,948	—	274	—	—	989	1,495	—
	Foreign	14,065	521	601	—	10	53	1,290	—	—	2,147
	Total -	81,912	17,642	94,028	9,192	7,971	2,743	3,146	1,932	15,277	11,582

Norfolk Quarterly Report.

PERHAPS in the memory of man there has never occurred a summer so hot and dry as the past has been. A temperature of 80, and from this to 87, certainly bespeaks a degree of heat to which the inhabitants of these variable climates have rarely been accustomed, and more particularly of late years. The consequence has been, that our pastures and layers were parched to that degree as to alarm us for their future fate, and very greatly to distress us for present keep for our stock. The Wheats (except on very burning gravels) have not suffered from the drought in proportion to the Barleys and other spring crops; though it is found, on thrashing them, that they do not yield equal to what had been expected. The quality, however, is good. Barleys, except on very rich soils (in which, unfortunately, this county is extremely deficient), have suffered prodigiously; and the crop is not, in general, more than half an average produce.

Our harvest was finished earlier than almost ever was known, and every thing got up dry. The Turnip crop, which, during the latter part of the summer, cut a most deplorable figure, is much improved since the rains in September; and the season still continuing remarkably warm and open, they have grown beyond all expectation. Still, they will fall short of an average crop; and Straw and Hay being very dear, there will be a difficulty with many in maintaining their usual proportion of beasts in yards. Potatoes are every where deficient, and are as dear as Apples, which, on the contrary, are remarkably plentiful. We have had most favourable rains for the Wheat sowing, which is in great forwardness. All the early sown is up, and looking most luxuriantly. Many are fearful of its being too forward, and that it will become what is locally termed *winterproud*. This, however, is only the natural effect of the extraordinary mildness of the season; the plants, both of Corn and Grass, continuing to shoot out most rapidly at a time when, in the generality of years, all vegetation would have ceased. The Corn Markets here are tolerably steady. Wheats are selling from 40s. to 43s.; Barleys, 30s. to 33s. per coomb of four Winchester bushels; other kinds in proportion. The Cattle Markets are very high, especially for Lean Stock. Lambs have been selling most exorbitantly, perhaps higher in proportion than any other description of stock; because the Turnips, generally speaking, are of a size better adapted for Sheep than Bullocks. Fine Wool is much lower than at the first of the season was expected; but long and half-bred fleeces fully maintain their value, and are in great demand.—28*th Oct.*

Northumberland Quarterly Report.

THE last week in July, and the month of August, were mostly warm, fair and droughty, with a wet day on the 26th of July, and showers on the 7th, 17th, and 29th of August. The 1st, 11th, 12th, 21st and 29th of September were wet; the rest of the month fair and favourable for the harvest. In the first fortnight of October, we had nearly alternate rain and fair days, until the 15th, which was very wet. Since that time it has been mostly fair, with some cloudy, moist

days. On the whole, this quarter has been remarkably favourable for harvesting the Corn crops; and the Wheat seed was probably never put in upon the summer-fallows and bean-stubbles in a more favourable state.

The Wheat crop is in general thin, but the grain of excellent quality, being matured by the hot sunny weather in July and August; and there being no loss by wind or wet, it may be reckoned as nearly an average crop. Beans and Peas, particularly the latter, are remarkably abundant crops.

Turnips are, in general, very good; but, in some places, they are much injured by the grub and wire-worm; at present they are selling from 6*l.* to 8*l.* an acre.

Sheep have been sold at higher prices than for some years past.—Long-wooled Ewes from 40s. to 48s. and Shearling Wethers from 46s. to 55s. per head. Cheviot Ewes, from 28s. to 32s.; and Wethers, from 30s. to 40s. per head.

The present prices for Fat Stock at Morpeth Market are—for Cattle, from 6s. 6d. to 7s. 3d. per stone (of 14 lib.) sink; and Sheep, from 7d. to 8d. per lib. sink.

In the Corn Market there has been little variation. The prices for Wheat being from 8s. 8d. to 9s. 6d.; Barley, from 6s. to 6s. 4d; Oats, from 4s. 2d. to 4s. 6d. per bushel Winchester.—*26th October.*

Nottinghamshire Quarterly Report.

The weather continued dry, with a few occasional showers only, during the whole quarter. Every description of grain has been harvested in extraordinarily good condition. Wheat is of excellent quality; yet, from being so thin on the ground, it cannot prove an average crop. Barley and Oats are the lightest ever remembered; a great number of acres of the former not averaging a quarter, and the crops from very superior lands prove very deficient. Peas and Beans have made a bad return; the latter were never known to ripen so early, as they were in many instances harvested before white corn upon the adjoining lands. Swede and Common Turnips have totally failed upon such strong land, and are, on the whole, very indifferent. This being the case, together with an extremely great deficiency of bulk in the stack-yards, keeping for stock must be extravagantly high, and very scarce before spring. Grass has grown more the last six weeks than during all the summer months; and keeping is just now very plentiful, many fields having more the appearance of spring than autumn. An unusual great quantity of wheat is sown; some of the earliest of which is so very forward, that it has been thought right to stock it with sheep. Many fallows are nearly cleaned for next year's turnips; and work of every description is remarkably forward.

Fat Beasts are selling at from 7s. 6d. to 8s. 6d. per stone. It was expected Beef would have been higher; but markets have been filled with half-fed ordinary stock. Fat Sheep from 8d. to 9½d. per lib., and Mutton must advance before spring. Bacon and Pork Pigs are worth from 8s. 6d. to 9s. 6d. per stone. Large Lean Pigs are low.

Horses of good figure and action, for every purpose, are well sold; and Foals at high prices. All descriptions of beasts are readily sold. This county has become preeminent for the breed of the improved Short-horned Beasts, many of the best which were sold at Mr Colling's sale having been purchased to come into it. There has been a brisk demand for Store-sheep; and many Leicester Rams have been let at improving prices. Wool maintains the prices given at shearing.

The crops of Potatoes have greatly improved, and prices are consequently lower. They were retailed in the markets six weeks and two months ago, at from 1s. 8d. to 2s. 6d. per Winchester peck, which was also the price of Apples. The best crops of Swedish Turnips have been worth upwards of ten guineas an acre; and White Turnips from a few shillings to nine pounds an acre. They are not quite so high sold at present. Turnips, upon light lands, have made much better progress than was expected.

Hops wonderfully improved for a few weeks previous to picking. The crop throughout England was fully double to what was expected in July. Many parcels are of excellent quality; and such have been sold at from 10*l.* to 11*l.* 5s. per cwt.; inferior as low as 6*l.* per cwt. An extrordinarily large quantity were shown at Retford fair on the 2d and 3d instant; and but few parcels were taken away unsold.

Much less Cheese has been made than usual. New Milk Cheese sold at from 80s. to 90s., and Mixed Milk Cheese at about 70s. per cwt. Onions were sold at 7s. to 8s. per peck.

New Wheat is worth from 80s. to 90s.; Barley from 70s. to 80s.; Oats from 40s. to 56s.; and Beans about 84s. per quarter. Last year's grain is considerably lower.

At Southwell Statute, on the 20th instant, wages for servants were about the same as last year. Labourers have 2s. per day. It is feared work will be very scarce during the winter.—29*th October.*

OBITUARY.

We are concerned to record the melancholy fate of Mr Wilkie, at Bonington, in the parish of Ratho. On Monday, the 28th September, that gentleman having just returned from his ride, proceeded to loosen the girths, in order to take off the saddle, when his mare, a vicious animal, turning suddenly round, bit him in the belly, and lacerated him in a shocking manner. Medical assistance was called in, both from the vicinity of the place and from Edinburgh; but, notwithstanding all their efforts, Mr Wilkie died on Tuesday evening, after enduring the most excruciating agony. The same animal bit one of the farm servants severely some time before; but he soon after recovered. A few years ago, a brother of Mr Wilkie lost his life by an infuriated ox. Mr Wilkie had long been a steady and useful supporter of this Work. He farmed his own property with skill and success; and was distinguished among his neighbours for his good sense and practical knowledge.

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END OF VOLUME NINETEENTH.

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D. Willison, printer, Edinburgh.

PREMIUMS

TO BE GIVEN BY

THE HIGHLAND SOCIETY OF SCOTLAND *for* 1818.

HIGHLAND SOCIETY CHAMBERS,
EDINBURGH, January 26, 1818.

The HIGHLAND SOCIETY of SCOTLAND does hereby advertise, that the undermentioned PREMIUMS are to be given by the Society, in the year 1818, &c.

ESSAYS AND COMMUNICATIONS.

1st, A Piece of Plate of Fifty Guineas value, will be awarded for the best and approved experimental Essay upon the Construction and Management of a Kiln, or set of Kilns, which shall have been found to be effectual in burning Sea-ware, both fresh and dried, into Kelp of good quality, having in view economy in the construction, and economy of fuel; with a comparative view of the quantity and quality of the kelp, when produced in the kilns, and when obtained in the common mode. The essays to be accompanied with correct models or drawings of the kilns recommended, and with specimens of the kelp produced. The premium not to be decided until 10th November 1819.

2d, A Piece of Plate, of Thirty Guineas value, will be given to the person who shall communicate to the Society the best and most satisfactory details of the practice of Sowing the Seeds of Forest Trees on waste or moor ground, founded on actual experiment, describing the best method of sowing the various kinds of seed in all the different varieties of surface and soil which occur in such grounds; the species of trees best adapted for raising in this way; the best mode of protecting such as are liable to the depredations of vermin, and of promoting the growth of the plants during the first four years. This premium not to be decided till 10th November 1820.

3d, A Piece of Plate, of Thirty Guineas value, will be given for the best and approved Essay describing the various insects which are injurious to Crops, pointing out the most effectual means of destroying them, and of repressing or preventing their ravages, without affecting the vegetables themselves.

The author will observe, that drawings or specimens of the insects (and in their different stages, should they undergo transformation), must accompany the essay; and that the premium will be awarded only to an essay founded on actual experiment, and containing information previously unknown to the public. The premium not to be decided until 10th November 1819.

4th, A Piece of Plate, of Fifty Guineas value, will be given for the best and approved Essay on the Construction of Railroads, for the conveyance of ordinary commodities. In this essay it will be essential to keep in view how far railroads can be adapted for common use in a country, the means of laden carriages surmounting the elevations occurring in their course, and whether railroads or the wheels of carriages may be so constructed as to be applicable to ordinary roads, as well as to railroads, so that no inconvenience shall be experienced on leaving either to travel on the other. The essay to be accompanied with such models or drawings as shall be sufficient to illustrate the statements it contains.

It is desirable that some account should be given of the principal railroads in Britain, together with a brief history of their introduction. The premium not to be decided until 10th November 1819.

RULES OF COMPETITION.

In all essays or communications, it is expected that, when facts not generally known are stated, they will be authenticated by proper references, and also that the essays shall be written in a fair and legible hand. The Society would likewise recommend that one page of the folio may be left blank for any observations which may occur to members of the Society on perusal.

The essays on subjects 1st, 3d and 4th, must be lodged with the Depute-Secretary of the Society, on or before the 10th November 1819; and the essays on subject 2d, by 10th November 1820.

A sealed note, containing the author's name, and inscribed on the back with the motto or device of his essay or communication, must be lodged therewith; and when the motto or device on the essay, or sealed note, is neglected by the author, such essay will not be allowed to compete for any premium.

N. B.—None of the sealed notes, except those which bear the distinguishing motto or device of essays found entitled to the whole, or a part of the premium advertised, will be opened; and the Society is to be at liberty to publish the essays, or extracts from them, for which the premium, or any part of it, shall be adjudged; and such essays as are not found entitled to any premium, will, with the sealed notes, be returned to the authors when called for.

Further, upon application from the gainers of those premiums, the Society, in such cases as they may see proper, will allow them to be paid in money.

IMPROVING THE QUALITY OF GRAIN.

I.—Drilled Wheat.

County of Berwick.

To the person who shall have the greatest extent of ground, within the county of Berwick, properly sown down in Drilled Wheat with a machine, crop 1818—A Piece of Plate of Twenty Guineas value. And to the person who shall have the next greatest extent, as aforesaid—A Piece of Plate of Ten Guineas value.

The extent of ground not to be less than 40 acres English measure, on one farm. Competitors to transmit to the Depute-Secretary of the Society, between and the 20th March 1819, a certificate under the hand of a regular landmeasurer, specifying the extent of ground so sown down; with a particular account of the management of the ground, nature of the soil, the quantity of seed sown, the expense of preparing and manuring the land, sowing, hoeing, and reaping the crop, and the amount of the produce, compared with the extent, management, quantity of seed, expense and produce of wheat sown broadcast on ground of similar quality on the same farm, and especially adverting to the comparative weights of the grain produced.

N. B.—Those intending to compete are required to intimate, in writing, to the Depute-Secretary; so that Members of the Society, or a Committee to be named, may have an opportunity of viewing the operations.

Barley, and Bear or Bigg,

Of the Greatest Weight, in the following Districts, viz.

1. Dunkeld, district of Perthshire.

2. Aird, ditto Inverness-shire.

3. The parishes of Cromarty, Resolis, Rosemarkie, Avoch, and Kilmuir Wester, in the counties of Ross and Cromarty.

To the person in *each* of the three districts above mentioned, who shall raise Barley of the greatest weight, upon any farm within the district, crop 1818—A Piece of Plate of Twenty Guineas value, or that sum in money. And to the person in each of said three districts, who shall raise Barley next in weight as aforesaid—Ten Guineas.

To the person in *each* of said three districts who shall raise Bear or Bigg of the greatest weight, upon any farm within the district, crop 1818—A Piece of Plate of Ten Guineas value, or

that sum in money. And to the person who shall raise Bear or Bigg, next in weight, in each of said three districts as aforesaid —Five Guineas.

N. B.—The Barley, and Bear or Bigg, in any of the cases, not to be less than 20 bolls Linlithgow standard measure, to be weighed between 10th and 24th November 1818; and the weight to be avoirdupois. The measures and weight to be ascertained in the presence of, and certified by a Member of this Society, or Justice of Peace, whose certificate shall be accompanied by the affidavit of the persons who actually weighed the grain. If the weight shall be equal for any of the premiums, the person who has the largest quantity to receive the highest premium; but the same person not to receive the premium for Bear or Bigg, as well as Barley. The affidavits to be lodged with the Depute-Secretary on or before 10th December 1818.

If it shall be found that these premiums are attended with beneficial effects, as connected with the legal distilleries which have recently been, or may in the interim be established, they will hereafter be extended to other districts.

SHEEP DRAINS.

District in Stirling and Dumbarton shires, viz.

The range of hill and pasture grounds in the counties of Stirling and Dumbarton, bounded on the east by the turnpike road from Bannockburn to Stirling, on the north and west by the continuation of the same road from Stirling by Drymen-Bridge to Dumbarton.

To the tenant in the district above described who shall, betwixt and 10th November 1818, make the greatest number of roods (not less than 6000) of sheep drains on his farm, at his own expense—Fifteen Guineas, or a Piece of Plate of that value, in his option.

Competitors must transmit to the Depute-Secretary, on or before the 20th of November 1818, certificates of the number of roods so made, and within what period. The certificates to be subscribed by two Members of the Society, and to be accompanied with an account of the state of the ground previous to the improvement, together with a precise description of the mode in which it was effected.

INTRODUCTION OF WOOL-STAPLING IN SCOTLAND.

To the Woolstapler who shall first establish himself in Scotland, betwixt and the 1st day of January 1820, in a situation to

be approved by the Directors—One Hundred Guineas. The woolstapler who intends to claim this premium, must, previous to settling, intimate his intention to the Society, and produce satisfactory testimonials of his qualifications. The premium not to be awarded until January 1821, upon satisfactory evidence being produced to the Society of the exertions of the competitor, and the degree of success which has attended the establishment.

N. B.—The principal object of the Society in offering this premium, is to evince its opinion of the advantages which would be derived from the introduction of wool-stapling in Scotland; and in the hope that proprietors of sheep-farms and wool-growers may adopt such measures as may secure that object.

PREMIUMS IN MONEY,

FOR ACTUAL IMPROVEMENTS IN AGRICULTURE, AND MELIORATING THE BREED OF BLACK CATTLE AND HORSES, &c.

CLASS I.

Premiums for raising Green Crops in the Counties of Orkney and Shetland, and Nairn.

FIRST DISTRICT.

County of Orkney and Shetland.

To the actual farmer, being a small proprietor or tenant in the county of Orkney and Shetland, who, on a farm or possession not exceeding 10*l.* Sterling of yearly value, shall have the greatest extent (not less than half a Scots acre) of his arable land under a turnip crop, three times hoed, in the year 1818—Three Guineas.

To the actual farmer, whether small proprietor or tenant, in the county of Orkney and Shetland, renting or occupying lands from 10*l.* to 40*l.* Sterling of yearly rent or value, who shall have the greatest extent (not less than four Scots acres) of his arable land under a turnip crop as aforesaid—Five Guineas.

To the tenant, in the county of Orkney and Shetland, renting lands from 40*l.* to 80*l.* Sterling of yearly value, who shall have the greatest extent (not less than eight Scots acres) of his arable land under a crop of turnips as aforesaid—Seven Guineas.

To the tenant in the county of Orkney and Shetland, paying a yearly rent of 80*l.* Sterling or upwards, who shall have the greatest extent (not less than ten Scots acres) under a crop of turnips as aforesaid—A Piece of Plate of Ten Guineas value, with a suitable inscription, or that sum in money, in his option.

To the actual farmer, whether proprietor or tenant, in the

county of Orkney and Shetland, occupying lands not exceeding the value of 10*l.* Sterling per annum, who shall have the greatest extent (not less than half an acre Scots measure) of his arable land well cleaned and properly sown with a crop of red clover and ryegrass, in 1818, which crop shall have been carefully protected from cattle, sheep, &c. after the grass seeds were sown and made into hay in 1819, for the first year's cutting—Three Guineas.

To the actual farmer in said county, whether proprietor or tenant, renting lands from 10*l.* to 40*l.* Sterling, who shall have the greatest extent (not less than four Scots acres) of his arable land sown down, managed, protected, and the crop made into hay for the first year's cutting, in 1819 as aforesaid—Five Guineas.

To the tenant in said county, who, on a farm not less than 40*l.* nor more than 80*l.* Sterling of yearly rent, shall have the greatest extent (not less than eight Scots acres) of his arable land sown down, managed, protected, and the crop made into hay for the first year's cutting, in 1819 as aforesaid—Seven Guineas.

To the tenant in said county, paying 80*l* Sterling or upward's of yearly rent, who shall have the greatest extent (not less than ten Scots acres) of his arable land sown down with grass seeds, managed and protected as aforesaid, and the crop made into hay for the first year's cutting, in 1819—A Piece of Plate of Ten Guineas value, or that sum in money, in his option.

SECOND DISTRICT.

The County of Nairn, including the Parishes of Petty and Ardersier, in the County of Inverness.

To the actual farmer, being a tenant in the second district, who, on a farm not exceeding 20*l.* Sterling of yearly rent, shall have the greatest extent (not less than one acre and a half Scots measure) of his arable land under a turnip crop, three times hoed in the year 1818—Four Guineas.

To the actual farmer, being a tenant in the second district, renting lands as above specified, who shall have the next greatest extent (not less than one Scots acre) of his arable land under turnip as aforesaid—Three Guineas.

To the actual farmer, being a tenant in the second district, renting lands not exceeding 20*l.* Sterling per annum, who shall have had the greatest extent (not less than one acre and a half Scots measure) of his arable land well cleaned and properly sown down with a crop of red clover and ryegrass in 1817, which crop shall have been carefully protected from cattle, sheep, &c.

after the grass seeds are sown and made into hay in 1818, for the first year's cutting—Six Guineas.

To the actual farmer, being a tenant in said second district, paying rent not exceeding 20*l.* Sterling per annum, who shall have the next greatest extent (not less than one Scots acre) under sown grass, as aforesaid—Four Guineas.

To the actual farmer, being a tenant in the second district, renting lands above 20*l.* Sterling, and under 60*l.* per annum, who shall have the greatest extent (not less than three Scots acres) of his arable land under a crop of turnips, three times hoed in the year 1818—Seven Guineas.

To the actual farmer, being a tenant in said second district, renting lands above 20*l.* and under 60*l.* per annum, who shall have the next greatest extent (not less than two Scots acres) under turnips in 1818, as aforesaid—Five Guineas.

To the actual farmer, being a tenant in the second district, renting lands above 20*l.* and under 60*l.* per annum, who shall have had the greatest extent (not less than three Scots acres) of his arable land well cleaned and properly sown down with a crop of red clover and ryegrass in 1817, which crop shall have been carefully protected from cattle, sheep, &c. after the grass seeds are sown and made into hay, in 1818, for the first year's cutting—Eight Guineas.

To the actual farmer, being a tenant in the said second district, renting lands above 20*l.* and under 60*l.* per annum, who shall have the next greatest extent (not less than two Scots acres) under sown grass, as aforesaid—Six Guineas.

N. B.—Certificates as to the premiums for turnips and sown grasses are to be subscribed by two members of the Society, or by one member, along with a justice of the peace, or the minister of the parish; and must specify the particulars in the respective articles above-described, with any other circumstances relative to the mode of cultivation, which may appear material. The certificates must further specify the amount of rent paid by the tenant; and in the event of the whole, or a part of such rent, being payable in grain, the same is to be converted into money at the fiar prices of the counties for the preceding year; and in the case of small proprietors in the county of Orkney and Shetland, the rent of their property, or the rent at which it would let to a tenant, must likelikewise be duly certified. Certificates (excepting as to the sown grasses in the first district) to be transmitted to the Depute Secretary by the 10th of December 1818.

CLASS II.

PREMIUMS FOR IMPROVING THE BREED OF BLACK CATTLE IN THE FOLLOWING DISTRICTS.

1. Rannoch, Perthshire.
2. The united parishes of Braemar and Crathie, Glengairn, Glenmuik, and Tullich, Aboyne, Lumphannan, Kincardine O'Neil, Strachan, Birse, Coul, Tarland, Migvie, Coldstone, and Banchory, in Aberdeenshire.
3. The parishes of Strathdon, Glenbucket, Alford, Kenethmont, Towie, Keig, Kildrummie, Clatt, Forbes and Kearn, Lochell, Cushnie, Touch, Auchindoir, Echt, Midmar, Monymusk, and Cluny, also in Aberdeenshire.
4. The parishes of Kirkmichael, Inveraven, Mortlach, and Aberlour, Banffshire; and Cabrach and Knockandow, in Aberdeen and Moray shires.
5. The district of Strathspey, in Inverness and Moray shires.
6. Badenoch and Rothiemurchus, in Inverness-shire.
7. Morayshire, in so far as not included in the 4th and 5th districts.
8. The parishes of Alness, Kiltearn, Dingwall, Fodderty, Contin, and Urray, in the counties of Ross and Cromarty.
9. The county of Caithness.
10. The following parishes of the Western or Dunblane district of Perthshire;—Dunblane, Kilmadock, Callander, Lecropt, Port, Aberfoyle, Kincardine, Balquhidder, and that part of Kippen within the county of Perth.
11. The following parishes in Stirling and Dumbartonshires, viz. Drymen, Buchanan, Balfron, Killearn, Fintry, Kilmaronock, and Strathblane.
12. The county of Bute, divided as follows—
    1. The island of Bute.
    2. The island of Arran.
13. The island of Skye, divided as follows—
    1. The parishes of Strath and Sleat.
    2. The parishes of Portree, Snizort, and Kilmuir, including Rasay, &c.
    3. The parishes of Waternish, Durinish, Minginish, and Bracadale.

For the best Bull, from two to seven years old, being the property and in the possession of any tenant in *each* of the *eleven* districts first above described, and kept on their farm or town from the 1st day of June to the day of competition—Ten Guineas.

For the second best Bull, from two to seven years old, belonging to and in the possession of any tenant, in *each* of the

eleven districts first above mentioned, and kept by him on his farm or town for the aforesaid period—Five Guineas.

For the best Quey, of two years old, the property of and bred by any tenant in *each* of the said *eleven* districts first above-mentioned—Five Guineas.

For the second best Quey, of two years old, the property of and bred by any tenant in *each* of said first-mentioned *eleven* districts—Three Guineas.

For the best Bull in *each* of the two divisions of the county of Bute, of the age, and under the same regulations as to property and possession, as are applicable to the eleven districts first described—Seven Guineas; and for the second best Bull in *each* division of said county of Bute, as aforesaid—Four Guineas.

For the best Quey, of two years old, the property of and bred by any tenant in *each* of the said divisions of the county of Bute—Four Guineas; and for the second best Quey, in *each* of said divisions as aforesaid—Two Guineas and a Half.

For the best Bull in *each* of the three divisions of the island of Skye, of the age and under the regulations above prescribed, as to property and possession—Eight Guineas.

For the second best Bull in *each* of the three divisions of Skye, as aforesaid—Five Guineas.

N. B.—The premiums in the Seventh, or Morayshire district, are limited to tenants paying rent not exceeding 100*l.* Sterling; and the bull premiums offered in the island of Skye are limited to tenants paying rent not exceeding 30*l.* Sterling per annum.

The following members of this Society (as members only, or their factors in their absence, can be named) are hereby appointed judges for the several districts and divisions, in the order above mentioned—

For the first district, the Hon. Baron Norton; Sir Niel Menzies of Menzies, Bart.; Col. Robertson of Strowan; J. S. Menzies, Esq. of Foss; Stewart Menzies, Esq. of Culdares; Robert Stewart, Esq. of Garth; Colonel David Stewart, and Allan Stewart, Esq. of Bunrannoch, or any three of them. Sir Niel Menzies to be convener.

For the Second District, the Earl of Aboyne; the Earl of Fife; Peter Gordon, Esq. of Abergeldie; William Farquharson, Esq. of Monaltry; Archibald Farquharson, Esq. of Finzean; the factor on Lord Aberdeen's estate in that district; and the factor on the estate of Invercauld, or any three of them. Mr Farquharson of Finzean to be convener.

For the Third District, Sir Archibald Grant of Monymusk, Bart.; Colonel Sir Alexander Leith, younger of Freefield; Sir

H. N. Lumsden of Auchendoir; Charles Forbes, Esq. of Edinglassie, M. P.; General Hay of Rannes; John Gordon, Esq. of Cluny; James Mansfield, Esq. of Midmar; Charles Gordon, Esq. of Wardhouse; John Farquharson, Esq. of Haughton; Andrew Farquharson, Esq. of Breda; the reverend Dr Forbes of Strathdon, and any other members resident in the district; three to be a quorum. Sir H. N. Lumsden to be convener.

For the Fourth District, George Macpherson Grant, Esq. of Ballindalloch, M. P.; James Shearer, Esq. of Buchromb; Major Gordon at Drummin; Major Stewart, Pittyvaich; Major Grant, Achnarrow; Captain Grant at Tombreckachie; Captain Gordon, Minmore; Robert Gordon, Esq. at Croughlie; Captain Macgregor, Delavorar; and the factors for the Duke of Gordon and the Earl of Fife, for that district; three to be a quorum. Ballindalloch, in his absence Major Gordon, to be convener.

For the Fifth District, Colonel Francis William Grant, M. P.; Major Grant, Auchterblair; Robert Lawson, Esq.; Dr Bayne of Granton; Captain Cumming, Docharn; and John Fraser, Esq. at Castle Grant, or any three of them. Colonel Grant, in his absence the factor of Strathspey, to be convener.

For the Sixth District, the Marquis of Huntly; G. Macpherson Grant, Esq. of Invereshie, M. P.; J. P. Grant, Esq. of Rothiemurchus, M. P.; and the Duke of Gordon's factor for that district; three to be a quorum. The Marquis of Huntly, and in his absence, Mr Macpherson Grant and Rothiemurchus, or either of them, to be convener.

For the Seventh District, his Grace the Duke of Gordon; the Earl of Moray; the Earl of Fife; Colonel F. W. Grant, M. P.; Sir George Abercrombie; Sir Archibald Dunbar; Sir William Cumming Gordon; and Sir John Leslie, Barts.; James Brodie, Esq. of Brodie; Lewis Dunbar Brodie, Esq. of Burgie and Lethen; C. L. Cumming, Esq. of Roseisle; George Grant, Esq. of Burdsyards; Captain Macleod of Dalvey; John Brander, Esq. of Pitgaveney; and William Young, Esq. of Inverugie; three to be a quorum. Sir Archibald Dunbar, and Sir W. G. Cumming Gordon, or either of them, to be convener.

For the Eighth District, Sir George S. Mackenzie of Coul, Bart.; Alex. Mackenzie, Esq. of Hilton; Hugh Monro, Esq. of Teaninich; Alexander Fraser, Esq. of Inchcoulter; Murdoch Mackenzie, Esq. of Ardross; and John Mackenzie, Esq. of Kincraig, or any three of them. Sir George Mackenzie, in his absence Hilton, to be convener.

For the Ninth District, the Right Honourable Sir John Sin-

clair, Bart.; Sir Benjamin Dunbar, Bart.; George Sinclair, Esq. younger of Ulbster; James Trail, Esq. of Hobister; James Horne, Esq. of Langwell; Benjamin Williamson, Esq. of Marlefield; William Horne, Esq. younger of Stircock; William Sinclair, Esq. of Freswick; James Sinclair, Esq. of Forss; John Sinclair, Esq. of Barrock; and John Gordon, Esq. of Swinzie; three to be a quorum. Mr Trail to be convener.

For the Tenth District, the Earl of Moray; Sir John Macgregor Murray; and Sir Alexander Campbell, Barts.; James Stirling, Esq. of Keir; Lieutenant-General Grahame Stirling; H. H. Drummond, Esq. younger of Blair Drummond; and any other members resident in the district; three to be a quorum. Sir John Macgregor Murray to be convener.

For the Eleventh District, his Grace the Duke of Montrose; W. C. C. Grahame, Esq. of Gartmore; H. MacDonald Buchannan, Esq. of Drumakill; Peter Speirs, Esq. of Culcruich; John Buchannan, Esq. of Ardoch; Robert Muirhead, Esq of Cr yleckie; John Ure, Esq. of Croy Cunningham; Peter Buchanan, Esq. of Auchmar; and Samuel Cooper, Esq. of Ballindalloch; three to be a quorum. The Duke of Montrose, in his absence Mr M. Buchannan of Drumakill, to be convener.

For the Island of Bute, the Marquis of Bute; Sir John Marjoribanks, Bart. M. P.; Archibald Macarthur Stewart of Ascog, Esq.; Colonel Archibald Moore; James Hamilton, Esq. of Kames; John M'Kinlay, Esq.; Mr Thom, Rothsay; and Mr Nelson, residing at Kames; three to be a quorum. Colonel Moore to be convener.

For the Island of Arran, the Marquis of Douglas and Clydesdale, Lord Archibald Hamilton, Robert Brown, Esq and any other members in the district; two to be a quorum.—Mr Brown to be convener.

For the 1st or Strath and Sleat division of Skye, Lachlan Mackinnon, Esq of Corrychattachan, Alexander Macallister Esq. of Strathaird, Norman Macdonald, Esq. of Barisdale, the Reverend Mr M'Kinnon of Sleat, and Mr Elder, residing in Sleat, or any two of them.—Corrychattachan to be convener.

For the 2d or Portree division, Lord Macdonald, James Macleod, Esq of Rasay, Lieutenant-Colonel Macdonald of Lyndale, and John Macpherson, Esq. or any two of them.—Rasay, in his absence Mr Macpherson, to be convener.

For the 3d division, John Norman Macleod of Macleod, Esq. Charles Grant, Esq. of Waternish, M. P. (in his absence his factor), Donald Macleod, Esq. of Talisker, and Captain Macleod of Gesto, or any two of them.—Mr Macleod of Macleod, in his absence his factor, to be convener.

RULES OF COMPETITION.

1. The Convener, with the approbation of a quorum of the judges for conducting the competitions in the eleven districts first above described, are respectively authorized, in such cases as they shall see proper, to divide the two premiums allowed for bulls, into three premiums, in such proportions as they shall approve, the first premium for bulls not being less than Eight Guineas; and in like manner to divide the sums allowed for Queys into three premiums, fixing their amount.

2. Further, at the several cattle competitions abovementioned, it shall be in the power of the judges who attend, to withhold the premiums, in any case where it shall appear to them that the bulls or queys produced are of such an inferior kind as to render it inexpedient to award premiums to their owners.

3. The times and places of competition are to be fixed by the conveners, with the advice of at least a quorum of their respective committees; and the competitions are to take place between the first day of August and the first day of November next.

4. The convener of each committee to give timely notice to the other judges of the district or division of the place and day of competition; and to be particularly careful that the same be intimated at the several parish church doors, for *at least* two successive Sundays previous to the competition.

As these premiums were given in several of the above mentioned districts in 1817, and in some of them also in 1816, it is to be observed, that the Society does not admit a bull which may have gained the first premium in a former year, to be produced in competition this year, in the same district. But a bull which may have gained the second premium may be allowed to compete for the first premium, either in the district in which he was formerly produced, or in another district.

The same persons not to obtain first and second premiums for bulls, or first and second premiums for queys, in one year.

In order to entitle the competitors to their respective premiums, a regular report, *signed by all the judges who attend* the competition, must be transmitted by the conveners to the Depute-Secretary of this Society, on or before the 10th of December next; and which report must specify the ages of the bulls and queys preferred; the length of time the bulls have been in possession of the competitor; and, with respect to the queys, that they were bred by the competitors, and were their property on the day of competition; the number of bulls and queys respectively produced thereat; the names and designations of the persons to whom the premiums have been adjudged; amount of premiums voted to each; and, in general, that

all the rules of competition fixed by the Society, as above mentioned, have been strictly observed; and, in particular, that the previous intimation to the judges, and advertisements at church doors, were regularly made as required.

CLASS III.

Premiums for Improving the Breed of Work-Horses in the following Districts of Argyll and Ross shires.

DISTRICTS.

1. The district of Appin, from the ferry of Connal to the ferry of Ballychulish, including the island of Lismore.

2. The north and east divisions of Ross-shire, containing the parishes of Kincardine, Eddertoun, Tain, Tarbet, Fearn, Nigg, Logie Easter, Kilmuir Easter, and Rosskeen.

For the best Stallion, from three to twelve years old, for the improvement of the breed of work-horses, the property, and in possession of any person in each of the districts above mentioned, kept for the use of the district, and exhibited within the same, at such times and places as the Committees after named shall fix, from the 1st day of May next to the day of competition—Ten Guineas.

For the best Brood Mare, for rearing work-horses, the property, and in possession of any tenant in each of said districts, from 1st January 1818 to the day of competition—Five Guineas.

For the best three-year old Colt or Filly, the property of, and bred by any tenant, in each of the two districts above mentioned—Three Guineas.

The following Members of this Society are appointed committees, for regulating every thing relative to the competitions, and judging thereat, viz.

For the first, or Appin district—Sir John Campbell of Ardnamurchan, Bart.; Alexander Maclean, Esq. of Ardgower; Robert Downie, Esq. of Appin; John Campbell, Esq. of Lochend; and Charles Stewart, Esq. of Ballechulish, or any two of them. Mr Downie to be Convener.

For the second district—Donald Macleod, Esq. of Geanies; Æneas Bruce Macleod, Esq. of Cadboll; Roderick Macleod, Esq. younger of Cadboll; Hugh Monro, Esq. of Teaninich; John Mackenzie, Esq. of Kincraig; Walter Ross, Esq. of Nigg; Murdoch Mackenzie, Esq. of Ardross, and any other Members resident in the district, or any three of them. Geanies to be Convener.

RULES OF COMPETITION.

The times and places where the stallions are to be exhibited, for the use of and within the districts, and also the time and place of competition for the premiums, are to be fixed by the convener of each district, with the advice of at least a quorum of the committee; and the times and places where the stallions are to be exhibited, and also the times and places of competition for the premiums, to be published by the convener, at the several church doors within the district, in due time, and in such other manner, as shall be thought most effectual for the information of those concerned.

The competition for the premiums must take place betwixt the 10th of August and the 1st of November next; and, when fixed, timely notice to be given by the convener to the other judges of the district, of the place and day of competition.

In order to entitle the competitors to their respective premiums, a regular report, subscribed by *all the judges who attend* the competition, must be transmitted by the convener to the Depute-secretary, on or before the 10th of December next, and which report must specify the age of the stallions preferred, the period the stallions and brood mares have been in the possession of the competitors; and with respect to the colts or fillies, that they were bred by the competitors, and were their property on the day of competition; the number of stallions, brood mares, and colts or fillies respectively produced; the names and designations of the persons to whom the premiums have been adjudged; and, in general, that the intimation at the church doors, and other rules of competition, were duly attended to.

PLOUGHING COMPETITIONS.

The Highland Society, finding that premiums to ploughmen, for improvement in ploughing, are now very generally given over the country by the resident gentlemen and local agricultural societies, has resolved to discontinue them, at least for the present; but being desirous of encouraging improvement in this branch of husbandry, the Society, under the regulations prescribed by former advertisements, will give its Silver Medal to the ploughman found to be the best at such competitions, upon a report of one or more members of the Highland Society, who may have attended them.

By order of the Directors,

LEWIS GORDON, Dep. Sec.

PREMIUMS

OFFERED BY THE

Highland Society of Scotland,

FOR

EXPERIMENTS WITH SALT.

Highland Society Chambers,
Edinburgh, 19th August 1818.

The Duty on Rock Salt, to be applied to purposes connected with Agriculture, having been reduced, by an Act passed in last session of Parliament, to 2s. 6d. per bushel, or L.5 per ton, the following PREMIUMS are offered by the Highland Society of Scotland for Experiments with Salt:

I. To the person in Scotland who shall make and report to the Society the best and satisfactory Experiments on the Effects of Salt as a Manure in General---A Piece of Plate, of Thirty Guineas value, or that sum in money.

II. To the person in Scotland who shall make and report to the Society the best and satisfactory Experiments on the Effect of Salt in Feeding and Fattening Live Stock---A Piece of Plate, of Thirty Guineas value, or that sum in money.

It is required that the extent of land to be treated with Salt shall not be less than Five English acres; and that the number of live stock, in the feeding of which Salt is used, shall not be fewer than five black cattle and twenty sheep. The respective reports must distinctly specify the nature of the experiments, and how often re-

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peated, the quantity and proportion of Salt employed, and any other circumstances connected with the subject, which may be considered material. The reports to be lodged with the Depute Secretary on or before the 10th November 1820, accompanied by certificates by two Members of the Society, or by one Member and a Justice of the Peace, in support of the several matters therein detailed.

By Order of the Directors,

LEWIS GORDON, Dep. Sec.

N. B.---It is recommended to those who may be disposed to compete for the Premiums, to peruse a paper containing much useful information on the subject, recently published by the Right Hon. Sir John Sinclair, a copy of which will be delivered to them on applying at the Society's Chambers. It may be farther observed, that the Society has obtained information from Messrs Marshall, Northwich, Cheshire, Proprietors of Salt Mines, that impure rock Salt, allowed by the act to be used for these purposes at the reduced duty, can be landed at Greenock or Glasgow for about Six Guineas a Ton, duty included.

PAPER
ON THE USES OF SALT,
FOR AGRICULTURAL PURPOSES.

BY THE RIGHT HON. SIR JOHN SINCLAIR, BART.

Referred to in the preceding Advertisement.

As Parliament has resolved that a reduction in the duties on Salt shall take place, for the purpose of ascertaining, by decisive experiments, its utility for agricultural purposes, it is proposed, in this Paper, briefly to point out, in what respects it has already been found of advantage. The Farmer will thus have some clue to direct his proceedings; and if the result of such proceedings, as he may thence be induced to try, *prove highly satisfactory*, and the importance of Salt to Agriculture is confirmed, *beyond the possibility of*

doubt, it may be the means of inducing Parliament to lower the duties still farther, or to commute them entirely, that so great a source of national property may not be impeded or curtailed.

It is the more necessary thoroughly to investigate this subject, as there is no substance that could, in so many different respects, be rendered so useful to Agriculture *as Salt*:—1. It operates as a manure to arable land;—2. It may be of use in promoting the fertility of waste land;—3. It is an effectual remedy against the smut;—4. It preserves the seed, when sown, from vermin;—5. It promotes the vegetation of oily seeds;—6. It increases the produce of pasture land and meadows;—7. It improves the quality of hay;—8. It renders coarse food more nourishing, and moist food less injurious to cattle and horses;—9. It preserves stock from disease, and improves their condition;—and, 10. It has a tendency to prevent the rust or blight in wheat.

1. *On Salt as a Manure to Arable Land.*—Though Salt, if employed in large quantities, in its natural state, is hostile to vegetation, yet it operates advantageously in various ways, when judiciously applied to arable land. In large quantities, it has a tendency, like every other excessive stimulus, to disorganize and destroy the vegetable substances with which it comes in contact; but in *moderate quantities*, it promotes the growth of vegetables, by enabling them to take up more nutriment in a given space of time, and to perform their circulations and secretions with greater energy*.

The following are modes in which it has been successfully made use of for the improvement of arable land.

1. In preparing the soil, *under the fallow process*, it is recommended to sow from thirty to forty bushels of Salt per statute acre, for the purpose of destroying the roots and insects in the soil, and breaking all the tough and adhesive clods which are found to be so troublesome in working the ground. This should be done in autumn, some time before the land is ploughed. The salt being thoroughly incorporated with the soil, during the spring and summer following, the strength of the Salt would be so much reduced, when the seed is sown, that instead of injuring, it will promote vegetation; and the land, it is said, will be found to produce a crop superior to those under any other mode of cultivation; the advantage of which will be experienced for several succeeding years†.

It would be extremely important, to compare the produce and expense of a fallow, treated in this manner, or manured with lime.

2. Salt has likewise been advantageously applied *to crops*. R. Legrand, Esq. tried it twice on a barley tilth, sowing the Salt at the

* Darwin's Phytologia, p. 336; Cheshire Report, p. 240.

† Hollinshead on the importance of Salt as a Manure, second edition, p.17. It is said that Mr Hollinshead devoted above twenty years of his life to a scientific and practical inquiry into the uses of Salt as a manure.—Sir Thomas Bernard's Tract on Salt, p. 279.

rate of sixteen bushels per acre, immediately after the crop was covered by the harrow. The verdure, in spring, exceeded any thing he had ever seen, and the ripened appearance was whiter, by many shades, than he had ever beheld*. Mr Hollinshead also recommends sowing sixteen bushels of Salt per acre on a crop of potatoes, as soon as they are covered with earth, and he maintains, that by the adoption of that system, alternate crops of wheat and potatoes might be permanently produced on the same soil†. These are modes of application, however, the utility of which ought to be tried by repeated experiments, before they can be confidently relied on.

3. It has been proved by Pringle and Macbride, that though Salt will, in large quantities, prevent putrefaction, owing to its antiseptic properties, yet that it has an evident tendency to promote the process, when used in small quantities. Hence the advantage of mixing it in moderate quantities with farm-yard dung‡, and other animal and vegetable substances.

An experiment was tried in Cheshire, of mixing grass roots, and other rubbish harrowed off the land, with foul Salt; it was then incorporated with other manures, and the effects of this compost, on a crop of barley and grass seeds, is said greatly to have exceeded the most sanguine expectations that had been formed of it§.

4. Salt, when applied in composts, is said to have been found a more beneficial manure even than lime. A Farmer mixed up a quantity of refuse Salt with the earth taken out of water furrows, and another portion of the same earth with lime. Of the two, the vegetation of that part of the field which had *the salt compost* laid upon it, was by far the healthiest and most vigorous‖.

5. In those parts of Cornwall, where the Pilchard Fisheries prevail, considerable quantities of old or condemned Salt¶, are used as a manure, mixed in compost, with earth, scrapings of roads, broken fish, sea sand, and stable dung. The quantity of Salt allotted to an acre, thus mixed in compost, is about a ton, which may cost about ten shillings. The broken fish is considered to be the most valuable article, and the Salt is accounted friendly to vegetation, in cases where it is thus used in a mild and modified state.

6. The most extraordinary circumstance, connected with the effects of Salt on vegetation, takes place in the southern provinces of France. The surface of the ground on the sea-coast of those provinces, contains a number of saline particles. When the season arrives for cultivating that species of soil, the Farmers find it necessary to sow, not only wheat, but a plant called *salicor*, or *kali*, which produces barilla. If a great quantity of rain falls from the

* Hollinshead, 2d edit. p. 12. † Ditto, p. 19.

‡ It may be advantageously strewed over farm-yard dung, when carried to the field.

§ Cheshire Report, p. 237. ‖ Ditto, p. 237.

¶ Sir Humphry Davy, (Lectures, 4to edit. p. 295,) states, that refuse Salt, which, however, likewise contains some of the oil and exuviæ of fish, has long been known *as an admirable manure* in Cornwall.

month of April to that of June, the wheat prospers, the Salt being washed down below the roots of the plants, leaving the saline particles, remaining near the surface of the soil. in that state of equilibrium which is favourable to the vegetation of grain. On the other hand, if the weather is dry, and the Salt remains near the surface, the *salicor* prospers, for it demands a great quantity of Salt for its vegetation. Thus, when the grain prospers, the salicor perishes, and when it succeeds, the grain is destroyed*.

2. *Of Salt, as promoting the Fertility of Waste Land.*---Having, at the desire of the Board of Agriculture, written to an intelligent Correspondent in the Netherlands, (M. Gillet of Brussels), to know whether the Farmers there had derived any agricultural advantages from the use of Salt, I received in return the following information, which explains how Salt, when judiciouly applied in compost, may promote the improvement of waste lands.

The Abbey of St Pierre, at Ghent, before the Revolution, broke up about 150 English acres, (fifty Flemish bonniers), of moor-land, near Oudenarde, and, in order to procure manure, they adopted the plan of collecting all the heath-clods or lumps the soil produced, into piles, and intermixed them with strata of Salt. These piles were turned over once a year, for three years successively, and were then spread upon the land, which, by means of that manure, produced good crops for two years. Being let to Farmers, the plan of using Salt was given up, and the soil becoming unproductive, was planted with brushwood or coppice. It was then, however, ascertained, that Salt, thus applied, dissolved the coarse heathy substances to be found in such lands, and converted them into manure.

The effect of Salt, applied in the same way *to peat*, in alternate stratas, is a most important subject of experiment, which, if successful, would greatly promote the improvement of waste lands. It would probably act more rapidly on peat than on heath, and would thence furnish an immediate manure for a crop of turnips, so well calculated for bringing such soils into a state of fertility.

3. *It is an effectual Remedy against Smut.*---It is well known that seed wheat, if immersed in water, so impregnated with saline particles that an egg will float in it, and frequently stirred, so that all the unsound grains will rise to the top, which are then skimmed off, will be exempted from smut, provided, after the wheat is separated from the pickle, it is spread upon the floor, and a sufficient quantity of new slacked lime, to dry the whole, is sifted upon it†.

4. *It preserves the Seed, when sown, from Vermin.*---In some parts of Scotland, where the oat crops were frequently destroyed by grubs, &c. it has long been a practice to mixt Salt with the seed, in the

* "*Si le ble a bien vegete, le salicor perit; et il prosper, lorsque le ble est detruit.*"—Traite sur la Culture des Grains, tome premier, p. 268.

It would be important to know if the crop of wheat, when it does succeed, is ever affected by the rust, in a soil so much impregnated with saline particles.

† East Lothian Report, p. 111.

proportion of one to thirty-two, but sometimes one in sixteen. Every means has been taken to ascertain the utility of the practice, and with uniform success. Salt destroys vermin in the ground, by making them void the contents of their bodies, such evacuations being too powerful for them to withstand. It has this additional advantage, that the vermin thus become food for those very plants, which otherwise they would have destroyed*.

5. *It promotes the Vegetation of Oily Seeds.*---This was first discovered in America, in the culture of flax, and it has since been ascertained in this country by the experiments of Mr Lee, of Old Ford, near Bow, in Middlesex. The quantity of Salt should be the same as that of the seed sown, namely, about three bushels per English acre. It is strewed on the surface after the seed has been sown. It improves greatly the quantity and quality of the flax, and in particular the quantity of the seed from the new crop. Though the experiments have hitherto been confined to flax, it would probably answer equally well with other seeds of an oily quality. It is supposed, indeed, that Salt is most useful, when it is mixed with substances containing oil, the union of the two being converted into a species of saponaceous matter, which is favourable to vegetation†.

6. *It increases the Produce of the Pasture Land and Meadows.*—It has been proved by experiment, in Cheshire, that after draining sour rushy land, if Salt be spread upon the surface, in the month of October, its effect on the crop of next year will be in the highest degree satisfactory. In one spot, where eight bushels were spread, a most flourishing crop of rich grass appeared in the month of May, but a still stronger crop in the month of July, where sixteen bushels had been applied‡.

It is stated, on most respectable authority, that Salt, sown thinly by the hand, will destroy the moss with which meadows and pasture lands are so apt to be infested§.

In the Netherlands, Dutch turf ashes, which are strongly impregnated with saline particles, are applied to the second, as well as to the first crop of clover, with great success; and Mr Hollinshead strongly recommends sowing six bushels per acre on meadows, after the hay is got in, particularly in dry and hot summers, and upon limestone and sandy soils. The moisture which the salt attracts and retains, powerfully assists vegetation, and produces a

* Lord Dundonald on the connection of Agriculture with Chemistry, p. 158.

† Equal quantities of Salt, and of turnip seed, were tried on a small plot of a garden, by the Author of this Paper; and the produce was more abundant than from the same quantity of turnip seed sown without Salt. The efficacy of Salt, as a destroyer of the turnip fly, or beetle, ought to be ascertained.

‡ Cheshire Report, p. 256.

§ Sir Thomas Bernard's Treatise, p. 105. See Col. Scobell's Evidence, ditto p. 270, note, as to its efficacy in removing moss on old leys.

crop greatly superior in quality to that obtained by the application of dung*.

For meadows it is found to be an advantageous practice to mix sixteen bushels of Salt with twenty loads of good earth, per acre, turning the heap over two or three times, that the substances in it may be thoroughly incorporated, and spreading it on the surface, either in autumn or spring†.

7, *It improves the Quality of Hay.*—The practice of salting hay, at the time of stacking it, has been practised in Derbyshire ‡, and in the North Riding of Yorkshire§. The Salt, particularly when applied to the second crop of clover, or when the crop has received much rain, checks the fermentation, and prevents moulding. If straw be mixed with the hay, the heating of the stack is still further prevented, by the straw imbibing the moisture. Cattle will eat not only such salted hay, but even the straw mixed with it, more eagerly than better hay not salted, and will thrive better upon it.

Lord Somerville is of opinion that Salt cannot be conveyed into an animal in a more effectual manner than by sprinkling it through a sieve, at the rate of twenty-five pounds weight of Salt to a ton of hay, when in the act of putting it together, for every particle is imbibed in the fermentation, without a possibility of waste. This salted hay is of great use to sheep, when put on turnips early in the season; for the tops being then rank and strong, many of the sheep die suddenly from pent-up wind, occasioned by excess of fermentation in the stomach. Salt, or salted hay, are then devoured by them with a greediness which denotes their salutary effect. By the use of salted hay, Lord Somerville did not lose one sheep on turnips in the autumn of 1801, though the season was rainy and unfavourable‖.

Doctor Paris likewise contends strongly for improving bad hay, by Salt, applying it in the proportion of about one cwt. of foul fishery Salt to three tons of hay. But of pure Salt, a third of that quantity may be sufficient; it should be sprinkled between the layers; it prevents mildew, and renders the hay more grateful, and more beneficial to cattle¶.

8. *It renders coarse Food more nourishing, and moist Food less injurious to Cattle and Horses.*—The ancients were accustomed to prepare their straw for feeding stock, by keeping it for a considerable time *sprinkled with brine*; it was then dried, rolled up in bundles, and given to oxen instead of hay**.

Mr Curwen finds, that if Salt be given to cows, with steamed

* Holinshead on Salt as a Manure, p. 26.
† Hollinshead on Salt as a Manure, p. 25,
‡ Derbyshire Report, vol. ii. p. 182.
§ North Riding Report, p. 177.
‖ Sir Thomas Bernard's Tract on the Salt Duties, p. 262.
¶ Ditto, p. 276.
** Dickson's Husbandry of the Ancients, vol. ii. p. 409.

chaff, and other inferior food, it makes them eat it up completely; and that, in a certain degree, it corrects the taste of milk when cows are fed on turnips, and increases the quantity they produce. In Cheshire they give their cows a little Salt when they are falling off in their milk*.

In Flanders it has been found, that a small quantity of pounded Salt is very beneficial for horses, when new oats are given to them, if the oats are at all moist: and there can be no doubt that moist food in general might be rendered less injurious by the same means; for instance, when raw potatoes are first given to horses.

Mr Curwen is convinced by experience, that chaff and straw might be rendered available to a much greater extent than at present, by the use of Salt.

9. *It preserves Stock from Disease, and improves their Condition.*—In several countries, as in America, the East Indies, Flanders, Sweden, and Spain, it has been found that Salt given to domestic animals is advantageous to them in various respects. It may be proper, however, to consider the best mode of applying it to the different sorts of stock, under distinct heads.

Horses.—Mr Birkbeck, in his notes on a journey in America, recently published, mentions that the horses he saw in the interior of that country were of an excellent description, *and are in high condition, even when travelling at the rate of forty-five miles per day, on long journeys.* They are fed well, getting from four to five gallons of oats per day, besides hay, *with a good handful of Salt about twice a-week.*

It appears from an experiment tried at Mr Alderman Farley's Salt-works at Droitwich, that Salt is of great use to horses. The quantity given was about four ounces, three days in the week, alternately mixed with chaff. The whole four ounces should not be given at once, but at several times in the day, about a table-spoonful each time. It makes the animals eat their food, and do their work better†.

Mr Curwen gives his horses employed at the farm, the colliery, &c. at the rate of four ounces per day, with their steamed potatoes, twice a-day. It makes them clean out their cribs, and is a great benefit to their health and condition.

Salt given to horse cures *the botts*; and, it is said, might be given with great advantage to race horses, and would prevent the necessity of applying those severe purges, to which they are at present subjected.

Cattle.—The uses of Salt to cattle are various. Besides increasing the quantity, and improving the quality of their milk, as already stated, it prevents their *hoving*, when fed on clover, or on turnips;

* Sir Thomas Bernard's Tract, p. 96. This makes them drink more abundantly, which increases the quantity of their milk.

† Sir Thomas Bernard's Tract, p. 264.

the tops of which have the same effects as clover, both on cattle and sheep, when eaten in any quantity.

Mr Curwen's experiments on this head are most important. From the 19th of November 1817, to the 3d of February 1818, he gave Salt to his cattle in the following proportions:

Sort.	*Number.*	*Quantity per Day, in Ounces.*
Cows and breeding heifers, -	40	4
Young and fat cattle, -	43	3
Working oxen, - -	18	4
Heifers and young oxen, -	21	2
Young calves, - - -	20	1
	142	

The cattle are said to have been in the highest state of health, ever since the use of Salt was commenced; no obstructions, or inflamations as formerly, and not a single animal out of order.

In some parts of America they give Salt to their cows, at the rate of about two bushels per annum.

In the East Indies they give Salt to their bullocks, in general daily, to the amount of two or three ounces, mixed with their feed of pulse; a due proportion of Salt they consider to be essential for their health, and almost as necessary as food.

Sheep.—The advantages of Salt to sheep are very great. It improves their wool considerably, as is experienced both in Spain and the Shetland Islands, where the pastures are so much impregnated with sea spray. It likewise prevents the rot, and destroys the different sorts of worms which are found in the bodies of sheep, in particular liver worms. (*Fascio hæpaticæ**). It is said to protect them likewise from the scab.

In Spain they give 128lb of Salt to 1000 sheep in five months; but in a wetter climate, like that of Great Britain, Lord Somerville thinks that a ton of Salt for every thousand sheep would be requisite. It should be given them in the morning, to counteract the bad effects of the dew. In dry weather a small handful may be put on a flat stone, or slate, and 10 or 15 of these stones or slates set a few yards apart, are enough for 100 sheep. If the sheep are brought to the place where the Salt is put they will lick it up quickly, if they find a craving for it; but if they do not want it, the Salt may be taken up, and reserved for future use. This may be done twice a-week, but in particular cases it may be offered thrice†.

Mr Curwen finds that Salt prevents what is called the sickness in the northern parts of England, or the *braxy* in Scotland, by which

* Baron Scultz's Observations on Sheep. Communications to the Board of Agriculture, vol. i. p. 318.

† Sir Thomas Bernard's Tract, p. 26

so many thousand young sheep are annually lost; a discovery of the greatest importance in those parts of the kingdom.

Hogs.—Great quantities of Salt are considered to be injurious to hogs, but in America Salt is occasionally given to them, to render them tame, and to prevent their being lost in the woods. * Mr Curwen also mixes some Salt with the steamed potatoes he gives his hogs, and he thinks with benefit.

On the general Uses of Salt to Stock.—This article is found serviceable in restoring the tone of the stomach, when impaired by any excess, either of food or of labour. It improves the quality of their dung, and renders the sprinkling of it with Salt unnecessary. It renders stock tamer. Mr Curwen finds that the sheep gather round the shepherd, and will hardly suffer the salt to be deposited on the stones. It overcomes all their natural fear and timidity of disposition; and as to other cattle, it brings the wildest of them to feed out of the hand. In America milch cows are so fond of Salt, after being a little accustomed to it, that if tempted to wander in the woods, they are sure to return, in order to procure their usual allowance. But above all, it preserves their health. Mr Mosselman, an intelligent farmer in the Netherlands, who keeps about 100 milch cows, oxen, and calves, 23 working horses, and 250 sheep, has used Salt for five years, *during which time his whole stock have been perfectly free from disorders.*

On the modes of giving Salt to Stock.—Some give it in a powdered state on slates, stones, or coarse cloths. Others put large lumps of rock-salt in the cribs or mangers of their stables and cow-houses, or hang it up so as to be accessible to cattle or sheep, who obtain, by licking, what they require. In Sweden, they imagine that the good effects of Salt may be greatly promoted by what are called licklings (*slekor.*) They consist of salt, pulverised wormwood, and juniper-berries, and are given, either in a coarse powder, or made with tar into a thick broth, or electuary, put into a hollow fir-trough, placed in the middle of the sheep-house, over which branches of fir are nailed across, to prevent the sheep from soiling themselves with the broth. Others mix brimstone with this pottage, and make balls of it, which may be particularly suitable for such sheep as are subject to eruptions. Some persons also mix with it tansy (*tanacetum vulgare,*) bay-berries, and garlick, as being good for the worms and the dropsy.

10. *It has a tendency to prevent Rust or Blight in Wheat.*—In the course of a most extensive inquiry into the causes of the rust, or blight in wheat, and the means of its prevention, it appeared that Mr Sickler, a farmer in Cornwall, was accustomed to manure his turnip land with the refuse Salt from the Pilchard fishery, and that any ground thus treated *was never liable to the rust or blight,* though it infested all the neighbourhood.†

* Birbeck's Notes on America, p. 138.

† Husbandry of Scotland, vol. ii. App. p. 150, Note.

This important circumstance is confirmed by a recent communication (dated 15th May 1818,) to the author, from the Rev. Robert Hoblyn, whose wheaten tillage, on a farm in Cornwall, was increased from 20 to 40 and 50 acres per annum. He used one ton of old salt, with one ton of fresh fish, mixed with earth, and from 20 to 30 tons of sea sand, and his crops, he states, were always good, "*and never infested with rust.*"

It is probable that the Salt is the only article in this compost that could be of material service in preventing the rust, by its checking putrefaction, the result of too frequent a repetition of corrupted manures; and if the fact were ascertained by decisive experiments, a still farther reduction of the duties on Salt might be confidently looked for, to secure our crops of wheat from the greatest of all its scourges.

CONCLUSION.

There is every reason to hope, from this enumeration, that important benefits to Agriculture will result from the reduction of the duties on Salt. But the anxious endeavours of Parliament, to promote the interests of the Farmer, will be in vain, unless he resolves to avail himself of the boon that has been thus conferred upon him. For that purpose, his attention to the various particulars above stated, is earnestly requested.

JOHN SINCLAIR.

Ormly Lodge, Ham-Common, Surrey,
28th May 1818.

APPENDIX

To the Paper drawn up by Sir John Sinclair, on the Uses of Salt for Agricultural Purposes;

Stating the Experiments, which are best calculated to ascertain the Advantages of using Salt, for objects connected with Agriculture.

If an Experimental Farm had been fortunately established under the sanction of public authority, and at the public expence, some years ago, when it was suggested, every use to which Salt was applicable in Agriculture would, most probably, have been ascertained before this time; and Parliament would have had decisive evidence, on which to have proceeded in its recent inquiries. As it is,

nothing remains to be done but to recommend a number of experiments to those who may be inclined to direct their attention to so important an object, to be tried as circumstances are favourable to the attempt. In this way much may be effected, provided the experiments are conducted with accuracy, and reported to the Board of Agriculture, for the purposes of comparison and publicity.

1. *Experiments on Fallows.*

To sow in Autumn from 30 to 40 bushels of foul Salt, or from 20 to 30 bushels of pure Salt, per acre, on strong soil, proposed to be fallowed. The land to be ploughed before winter, and frequently stirred in spring and summer, so that the Salt may be thoroughly incorporated with the soil before the seed is sown. In the course of this experiment, the following particulars to be ascertained: 1. Whether the Salt destroys weeds and insects;—2. Whether it makes the soil more friable, and less tough or adhesive;—3. Whether it produces an abundant crop of barley, or of wheat, free from rust or blight;—and, 4. What are the effects on the succeeding crop of clover, and the crops that follow it.

It would be very important to compare the land thus treated with an equal quantity of the same field, *manured with lime*, stating the expence of each, and their relative produce; and what would have been the expence, had the Salt been exempted from duty.*

2. *Experiments on Crops of Grain and Roots.*

To sow, on various crops, as wheat, barley, oats, beans, pease, potatoes, and turnips, as soon as the seed is covered with the earth, 16 bushels of foul Salt, per statute acre, or from 10 to 12 bushels of pure Salt, *on the surface*, leaving it to be washed into the soil by rain, for the purpose of ascertaining the following particulars: 1. What are its effects upon the different crops on which the Salt is tried; 2. Whether it answers best on strong or light soils; 3. Whether it destroys the wire-worm, grubs, the turnip-fly, or the beetle, and other vermin destructive to crops; 4. Whether it prevents scabbiness on potatoes; 5. Whether salted turnips are less injured by the fly; and, 6. What are its effects on the after crops.

A similar experiment may be tried, sowing the Salt about a fortnight before the seed, and mixing it with the soil by harrowing it in.

3. *Experiments for the Improvements of Waste Lands.*

To collect heath-clods and other refuse, when waste lands are first cultivated, and, instead of burning them, to mix them with layers of Salt, so as to convert them into manure, and to try the effects of that manure with a crop of turnips or potatoes.

* It is to be observed that Salt at the works costs only sixpence per bushel, weighing 56lb. and for sixpence, that it may conveyed to any part of the united kingdom. But the tax formerly amounted to 3000 per cent. of the prime cost.—See the Letter by William Horne, Esq. of Liverpool, on the Repeal of the Duty on Salt, printed anno 1816, p. 6.

4. *Experiments with Salt, as a Remedy against the Smut.*

To ascertain, by comparison, whether immersing seed-wheat in water, so impregnated with Salt that an egg will float in it, is not an effectual remedy against the smut, provided the seed be frequently stirred in the water, and the light grains skimmed off, and the seed afterwards dried, by having new-slaked lime sifted upon it.

5. *Experiments for ascertaining the Effects of sowing Seed with Salt.*

To sow various sorts of seed,---in particular those of an oily quality, with different proportions of Salt, varying from equal quantities of Salt and seed to one-sixteenth of Salt, in order to try the effects resulting therefrom, whether in regard to improving the crop or preserving the seed from the attacks of vermin in the ground.

6. *Experiments on Grass-Lands.*

To try the effects of strewing, in autumn, sixteen bushels of foul Salt, or from 10 to 12 bushels of pure Salt per acre, on coarse herbage, or on peaty soils, also on grass-lands covered with moss in spring; and to compare the effects with lands not so treated.

7. *Experiments on Crops of Clover.*

To make a compost of fine earth with Salt, in the proportion of five, ten, or fifteen bushels per statute acre, (the preferable quantity not being yet ascertained,) and to strew it on the first crop of clover in the months of March or April, or on the second crop immediately after the first crop is cut, and to compare the effects of this compost with parts of the same field not treated in that manner.

8. *Experiments for ascertaining the Effects of Salting Hay.*

To mix Salt, at the rate of from 25 to 35 pound weight of pure Salt. per ton of hay, when in the act of putting it together, particularly with the second crop of clover in wet or damp seasons, in order to ascertain whether it prevents hay from becoming mouldy, and whether it is not more acceptable to stock than hay not salted. Also, to apply Salt or brine to damaged hay when given to stock, and to ascertain whether, though refused by them in its original state, they do not eat it greedily when salted.

9. *Experiments to try the Effects of Salting Coarse or Moist Food.*

To sprinkle straw with brine, also to mix Salt with new oats. raw potatoes when first given to horses, or clover cut later than usual, and given to horses or cattle, in order to ascertain whether coarse food may not thus be rendered more palatable and nourishing, and moist food less injurious.

10. *Experiments with Stock.*

To try the effect of giving Salt to stock in the following proportions:

1. To horses per day, from three to four ounces.
2. To cows and breeding heifers per day, from three to four ounces.
3. To working oxen, from three to four ounces.
4. To young cattle, from two to three ounces.

5. To calves, one ounce.

6. To sheep, at the rate of two ounces of Salt per week, divided into three portions.

7. To hogs in small quantities, occasionally mixed with their food*.

By some it is said that poultry do not thrive with Salt, though it is well known that pigeons relish it much.

These experiments are recommended for the purpose of ascertaining by comparison with animals receiving no Salt, whether they thrive better with the addition of Salt to their food;---whether they thrive better on coarse fare;---whether it improves the flavour of milk from cows fed with turnips;---whether stock in general become tamer and more domesticated;---and whether they are more free from disease,---as the botts in horses, and the rot, the sickness, or the scab in sheep†.

The Salt to be given to stock, to be either powdered and mixed with their food, or in that state put on stones, slates, or coarse cloths for them to lick,---or in large lumps, so placed that the stock may have access to lick them‡.

12. *Experiments to ascertain whether Salt will prevent the Rust or Blight in Wheat.*

To mix with the soil a fortnight before the wheat is sown, from 30 to 40 bushels of foul Salt, or from 20 to 30 bushels of pure Salt, for the purpose of ascertaining its effects on the succeeding crop of

* It is said, that in Ireland, when fattening their hogs, they sprinkle a little Salt with every meal, by means of which they are found to fatten in half the period they would otherwise require.—Observations by John Marshall, Esq on the Medical as well as Dietetic Properties of Common Salt, in the London Medical and Physical Journal, vol. xxxix. No. 231.

† Some important information is given of the great advantage derived from giving Salt to sheep, in considerable quantities, in the district of Crau, near Arles, in France.—See Annals of Agriculture, vol. xxiv. and Horne s Letter on the Salt Duties, p. 11; also vol. i. of the Memoirs of the Royal Academy of Sciences at Paris, where there is a paper, entitled, "Physical Observations on the effect of Salt in Fattening Cattle."

‡ The importance of Salt to Stock may be proved indirectly from its great utility to the human species. The ancient laws of Holland ordained men to be kept on bread alone, *unmixed with Salt*, as the *severest* punishment that could be inflicted in that moist climate. The effect was horrible: these wretched criminals are said to have been devoured by worms, engendered in their own stomachs. The lower orders of people in the inland parts of Cornwall, suffer the greatest distress from the same cause, being obliged to eat their potatoes without any relish; and their children, who have salt still more rarely, become infested with worms. A lady, who had a great antipathy to Salt, and had never taken any, nor even salted meat, was infested by worms from her earliest infancy, during her whole life. This proves the advantage to be derived from Salt to every animal liable to that disorder: and the reason why children are more apt to be troubled with worms than grown-up persons, is this, their taking less Salt with their food, and frequently none. This is a point that ought to be particularly attended to at schools and public seminaries, where great numbers of young people are collected. Where Salt cannot be had at a price within reach of the poor, salted meat or fish, herrings in particular, should be recommended to them, more especially if they lived much on potatoes.

wheat, and in particular whether it prevents the rust or blight; also, to ascertain whether a crop of wheat, sown after turnips, raised with Salt mixed in the manure, is exempted from the rust.

There is reason, from analogy, to hope, that Salt may be of use in this respect. It is so great an enemy to corruption, or putridity, that the wood employed in Salt mines, to support the roof or sides of the mine, or the beams of wood in Salt warehouses, remain undecayed for ages*. It is natural, therefore, to suppose, that Salt, judiciously applied, will likewise prevent the injury which plants receive from the fungus tribe, to which the disease called rust is attributed.

12. *Experiments for Improving the Quality of Dung, by mixing it with Salt.*

To ascertain, by comparative experiments, whether strewing Salt over dung improves its quality and the crops it produces, and what quantity is most beneficial.

13. *Experiments for converting the Roots and Stems of Vegetables into Manure.*

To collect the roots and stems of weeds growing in the fields, or in hedges and hedge-rows, to see what proportion of Salt it would require, to convert the whole into a substance capable of furnishing food for plants.

14. *Experiments for converting Peat into a Manure by means of Salt.*

To make a compost of peat and Salt, mixing it occasionally, to ascertain what proportion of Salt is necessary to convert peat into a manure for turnips and other crops.

15. *Experiments with Composts of Earth.*

To make a compost, with the usual quantity of lime, and another with Salt, at the rate of 16 or 20 bushels per acre, and to ascertain the difference in point of expence,---in regard to the apparent effect of the lime and the Salt on the earth,---and on the ensuing and succeeding crops.

16. *Experiments to ascertain whether the Weight of Butter or Cheese is augmented by the Salt used in manufacturing either of these Articles;---and whether the Farmer is indemnified by the additional Weight for the expence of the Salt.*

It is said, that a farmer in Cheshire, (Mr Weaver,) who had mixed a pound of Salt with ten pound of butter, found, that after working it in the usual manner, the salted butter only weighed 10 lb. one ounce; whereas that ten pound of the butter, unsalted, had continued of the same weight. Mr Weaver likewise asserts, that having rubbed in three pound of Salt into a cheese of 46 lb. weight, it was reduced in six days to 43 lb.; whereas the same quantity of milk made into a cheese that weighed on a Monday 46 lb. without Salt, weighed on the Saturday following 43½,---a proof that Salt decreases the weight of cheese.

* Sir Thomas Bernard's Tract on Salt, p. 278.

CONCLUSION.

On the whole, it is hoped, that every public-spirited farmer will try some of these experiments, according as his situation and other circumstances will admit of them; for the purpose of proving, that the attention which Parliament has bestowed on this occasion, to the interest of the farmer, has not been misapplied.

On the Uses of Salt in Gardens.

This is a subject well entitled to the attention of the Horticultural Societies of London and Edinburgh. In this place it is only necessary to observe, that several respectable individuals have ascertained the importance of Salt as a manure for fruit trees*; and it is said, that the vines and other fruits produced on the borders of the Rhone, are improved by the same application†.

Mr Hollinshead suggests, that every thing that is sown or planted in a garden or hot-house should have a portion of Salt sprinkled on the surface of the ground around it, immediately after the seed is covered with the earth‡. The advantage derived from the application of Dutch ashes, so full of saline particles, to gardens in the Netherlands, is a full confirmation of this doctrine.

Mr Beck, gardener, of *Chorley*, in Lancashire, has constantly made use of Salt in his garden for upwards of thirty years, and he has invariably found it to exceed every other manure he could have used for that purpose, *particularly for onions* §. He sowed the Salt immediately after the seed was covered in, at the rate of about sixteen bushels per acre, or five pounds ten ounces per pole or perch, or three ounces per square yard ‖.

Drilled carrots also grow well in a salted bed, the Salt being laid under the surface, in the centre of the intervals between the rows, and at some distance from the roots, that it may be dissolved before the fibres of the roots meet it ¶.

N.B. In a recent communication from A. Bracebridge, Esq. of Walton-on-Thames, he states, that some years ago the Clergyman of Holmes Chapel, who lived near the Salt Works, gave a favourite old mare, who was much broken-winded, some spoilt hay *that had been salted*, (at that time Salt for agricultural purposes was free of duty,). The mare had nothing else to subsist on, but throve on that food so well that she was fit to be put to work again next spring. This induced Mr Bracebridge to drench some rotten sheep, night and morning, with strong brine, after which he did not lose one;—they became fat, and the meat was as fine and good as if the animals had never been affected.

* See Hill on Fruit Trees; also Sir Thomas Bernard's Tract, p. 269.

† See Horne's Letter, p. 14; Annals of Agriculture, vol. xxiv. and Memoir of the Academy of Sciences in France, vol. i.

‡ Hints on Salt, as a Manure, by Hollinshead, second edit. p. 28.

§ On that account sea-weed is such an excellent manure for onions. If the Salt is sown after the crop appears above ground it is destroyed.

‖ Hints on Salt as a manure, by Hollinshead, p. 28.

¶ Husbandry of Scotland, second edit. vol. ii. App. p. 182.

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